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# Mathematics 5

## Whole Numbers

Learning Technologies Branch

Alberta LEARNING

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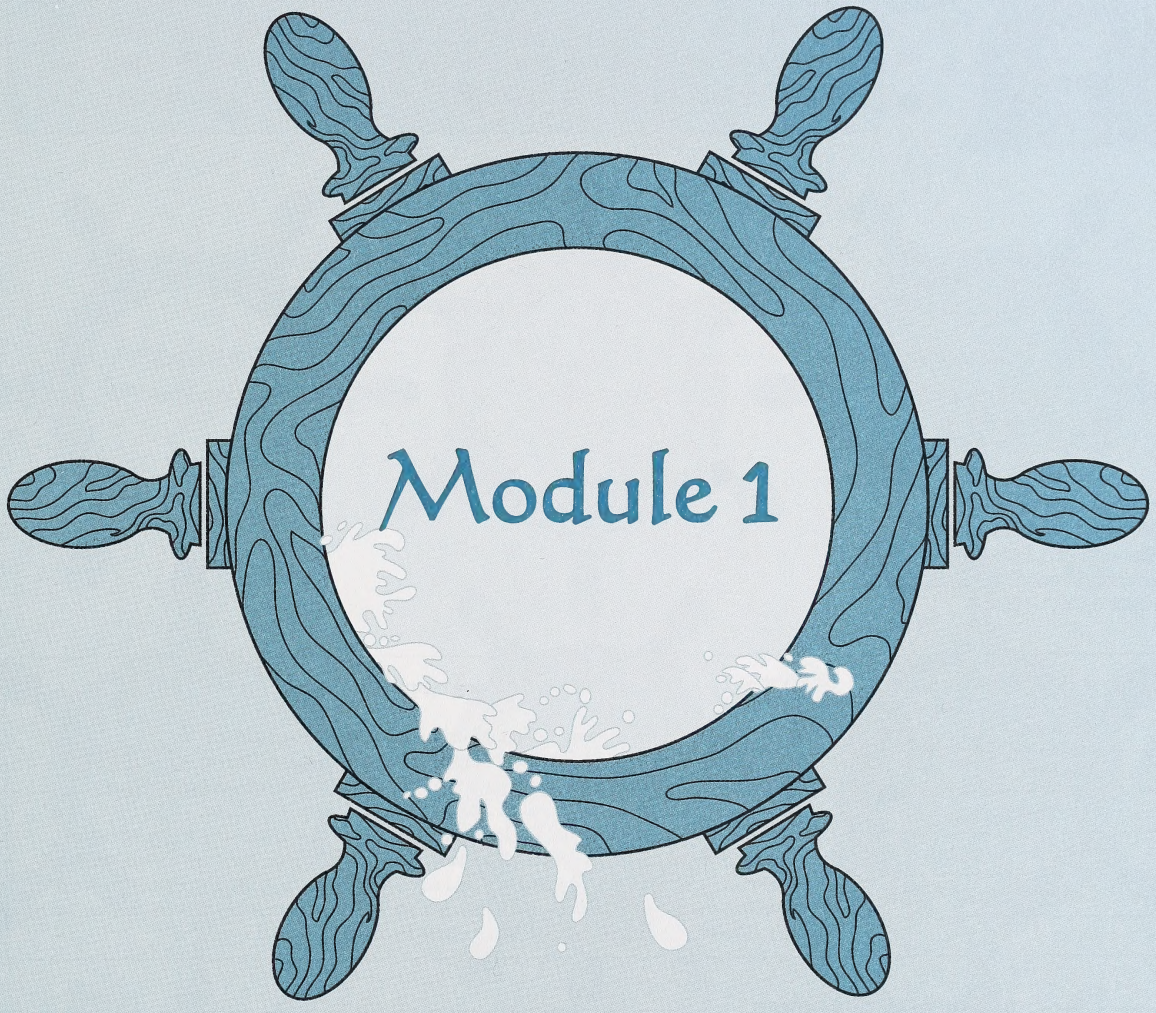
# Mathematics 5




## Whole Numbers

Learning Technologies Branch

Alberta LEARNING

Mathematics 5
Module 1: Whole Numbers
Student Module Booklet
Learning Technologies Branch
ISBN 0-7741-1952-7

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|---|---|
| Students | ✓ |
| Teachers | ✓ |
| Administrators | |
| Home Instructors | |
| General Public | |
| Other | |

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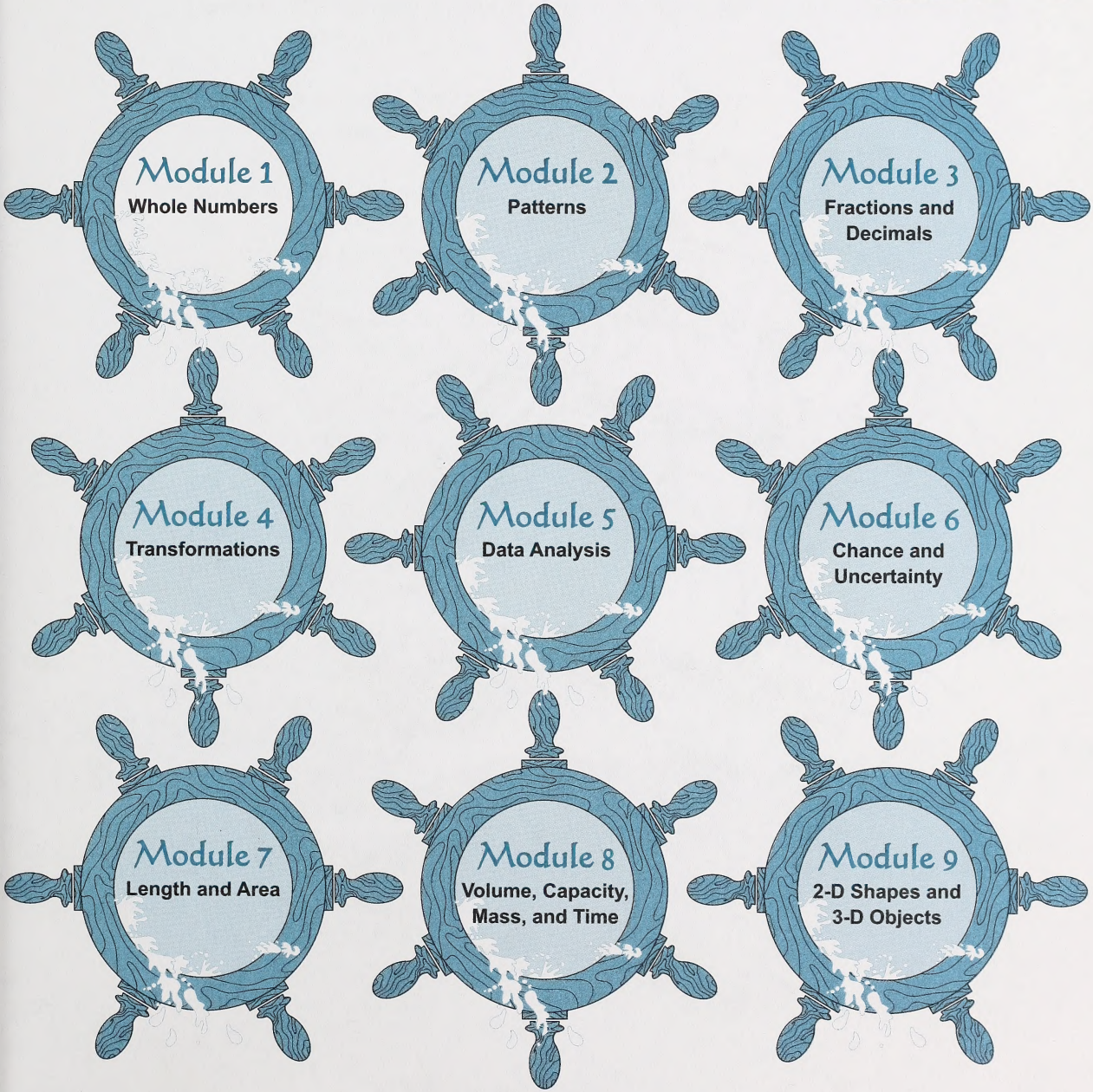
# Welcome Aboard
# Mathematics 5

Ahoy! Mathematics 5 contains nine modules.
You should work through the modules in order (from 1 to 9) because concepts and skills introduced in one module will be reinforced, extended, and applied in later modules.



# Adventures on the High Seas

**Kassidy:** Connor, guess what? I noticed an advertisement in the newspaper. A second-hand bookshop just opened, and it's supposed to have some really old books from all over the world.

**Connor:** Some may even be older than our great-grandparents! Let's go take a look.

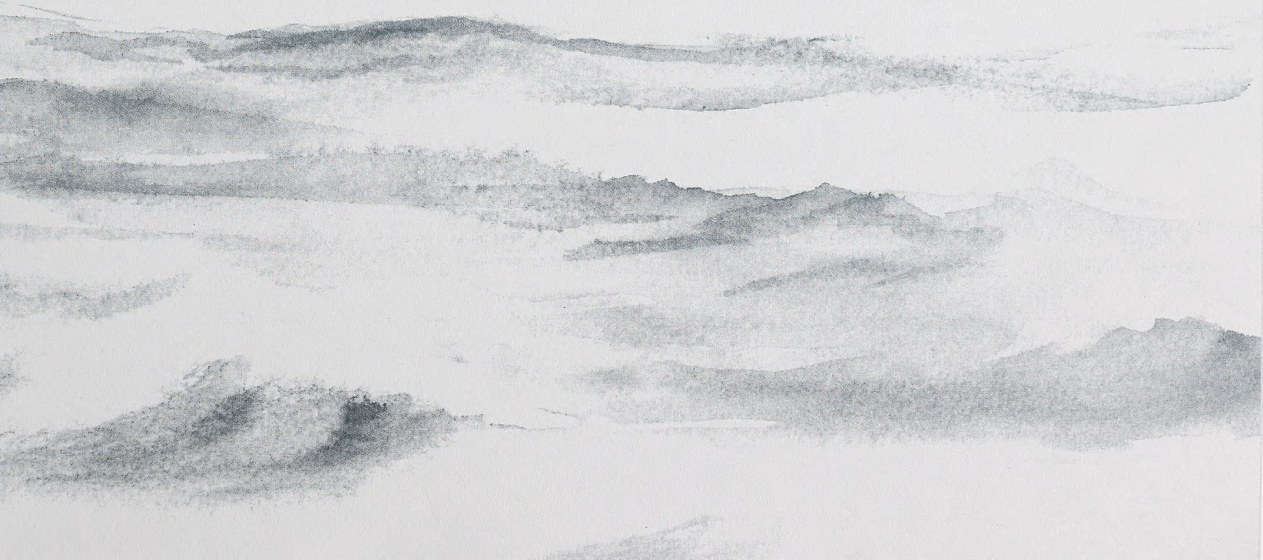
Excited about what they might find to read, Connor and Kassidy hurry off to the bookshop.

**Connor:** Wow! Look at this, Kassidy. Here's an actual journal kept by Captain Quinn almost 300 years ago. It's kind of musty, and parts are hard to read, but look at how much math the captain used!

**Kassidy:** There are also maps, descriptions of ships, and reports about sea conditions.

**Connor:** Let's buy it. Figuring out what the journal says will be like unravelling a mystery. Maybe it will have clues about real buried treasure.

From time to time throughout the course, you will work with many of the facts and figures about the days of sailing boats and sea captains that Kassidy and Connor discover.



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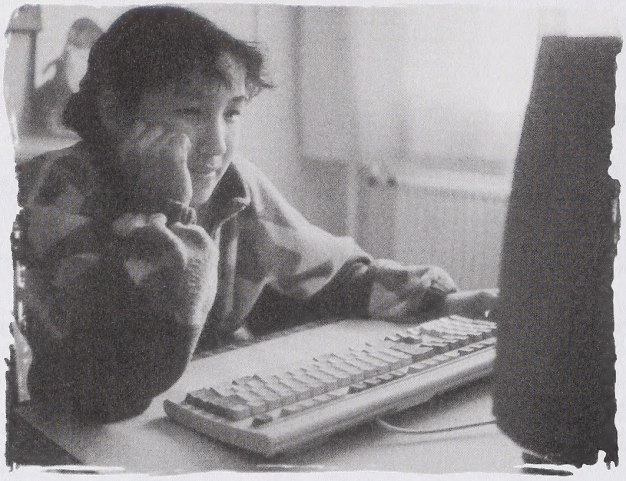
# Course Features



BRYAN AND CHERRY ALEXANDER PHOTOGRAPHY

Take the time to look through the Student Module Booklet and the Assignment Booklets and notice the following design features.

- Each module has a Module Overview, Module Summary, and Review.
- Each module has several lessons. Each lesson focuses on a big idea that is central to the topic being learned in the module.
- Each lesson has several activities. An activity in each lesson is related to the high seas adventure theme. The last activity in each lesson is a Challenge Activity.
- Each module has a Glossary and an Answer Key in the Appendix. In several modules there are also special pull-out pages in the Appendix.
- Each module has special exercises that focus on certain mathematical skills. For example, The Numbers in the News project involves a scavenger hunt for samples of math in everyday life. The Keystrokes exercise introduces some "funky features" of the calculator that can be used to explore and practise important number ideas.

## Required Resources

There are no spaces provided in the Student Module Booklets for your answers. This means you will need a binder and loose-leaf paper or a notebook to do your work.

In order to complete the course, you will need a copy of the Mathematics 5 textbook, *Quest 2000: Exploring Mathematics*, the soft-cover book *Quest 2000: Exploring Mathematics: Practice and Homework Book*, a basic four-operation calculator (such as the TI-108 calculator), and various manipulatives (base ten blocks and pattern blocks).

If you wish to complete the optional computer activities, you must have access to a computer that is connected to the Internet.

## Visual Cues

For your convenience, the most important mathematical rules and definitions are highlighted. Icons are also used as visual cues. Each icon tells you to do something.

Use your calculator.

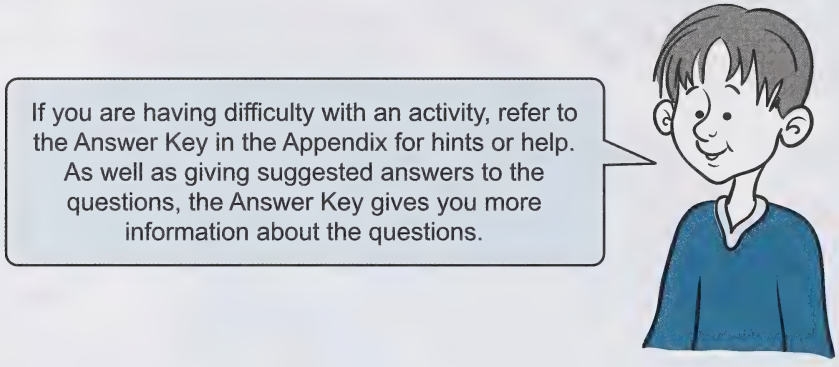
Use the Internet.

Refer to the textbook or the Practice and Homework Book.

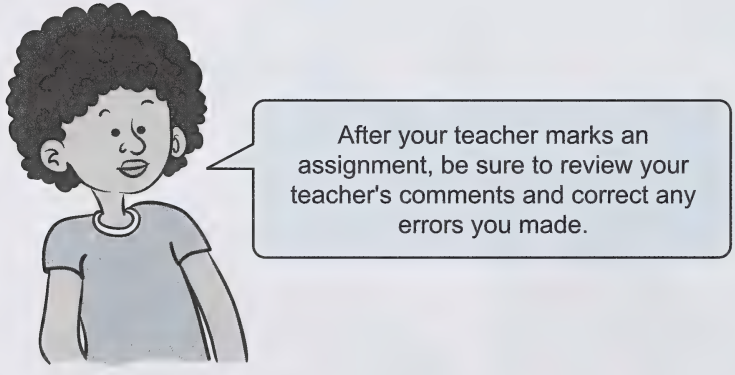
Your guides for this course are Kassidy and Connor.

# Assessment and Feedback

The Mathematics 5 course is carefully designed to give you many opportunities to discover how well you are doing. In every activity you will be asked to turn to the Appendix to check your answers. Completing the activities and comparing your answers to the suggested answers in the Appendix will help you better understand math concepts, develop math skills, and improve your ability to communicate mathematically and solve problems.


If you are having difficulty with an activity, refer to the Answer Key in the Appendix for hints or help. As well as giving suggested answers to the questions, the Answer Key gives you more information about the questions.

Twice in each module you will be asked to give your teacher your completed assigments to mark. Your teacher will give you feedback on how you are doing.




There will be a final test at the end of the course. You can prepare for the final test by completing the Review at the end of each module.

# Module Overview

As a young child, you were probably curious about the numerals on football jerseys, houses, clocks, telephones, and money. Over the years, your number sense and skills with numbers have improved.

Now a day rarely goes by when you don't use numbers in some way. You use numbers to count, measure, estimate, locate, and communicate. In fact, you probably use numbers so much in your daily life that you may not even be aware that you are "doing math."

In this module you will work with whole numbers. You will use base ten blocks and diagrams to show the operations of multiplication and division, and you will calculate products and quotients using paper-and-pencil methods. You will review and extend your understanding of whole number ideas by estimating, reading, writing, rounding, comparing, and ordering large numbers.

Your mark on this module will be determined by how well you complete the two Assignment Booklets.

The mark distribution is as follows:

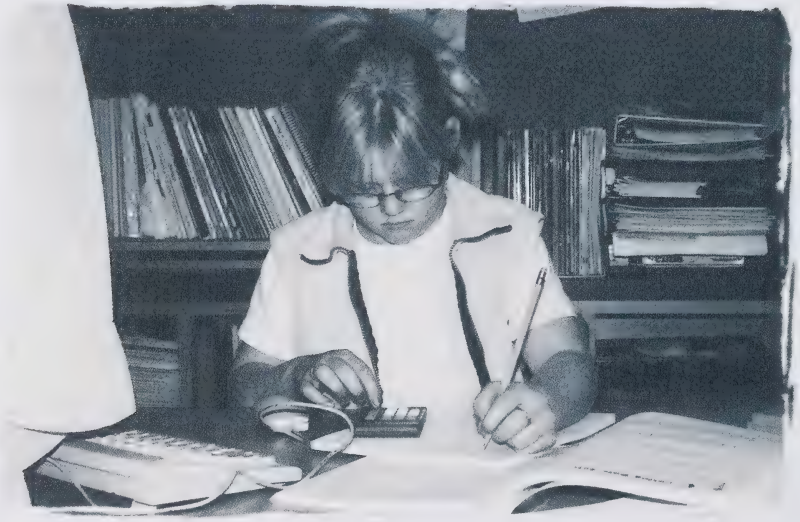
## Assignment Booklet 1A

| | |
|---|---|
| Lesson 1 Assignment | 25 marks |
| Lesson 2 Assignment | 15 marks |

## Assignment Booklet 1B

| | |
|---|---|
| Lesson 3 Assignment | 20 marks |
| Lesson 4 Assignment | 30 marks |
| Numbers in the News | 10 marks |
| Total | 100 marks |

When doing the assignments, work slowly and carefully. Be sure you attempt each part of the assignments. If you are having difficulty, you may use your course materials to help you, but you must do the assignments by yourself. You will submit Assignment Booklet 1A to your teacher before you begin Lesson 3. You will submit Assignment Booklet 1B to your teacher at the end of this module.



# Numbers in the News

Numbers are everywhere! Newspapers and magazines are full of stories and articles that show how numbers are used every day. The following scavenger hunt asks you to look through newspapers and magazines for samples of number ideas like those you will be using in the module. Read through the list now and begin by collecting samples of the ideas you already understand. You may collect other samples as you learn about them in the module. Collect as many samples as you wish.

## Scavenger Hunt

Cut out samples of each of the following number concepts from newspapers, flyers, and magazines.

1. the number 10 000
2. a number between 500 000 and 900 000
3. two different numbers that round to 30 000
4. a number that is the sum of two or more numbers
5. a number between 5000 and 10 000 that represents the difference between two numbers
6. a number greater than 80 000 that is used as a factor in multiplication
7. a number used as a divisor
8. a number between 1000 and 10 000 that represents an exact amount
9. a number greater than 100 000 that represents an estimate

You will find further instructions for submitting your project in Assignment Booklet 1B.

# Lesson 1

## Number Sense

Did you know that, on average, blond-haired people have more hairs on their heads than dark-haired people do? People with blond hair have about 140 000 hairs on their heads, while people with dark hair have about 110 000.

Do you think red-haired people have, on average, more hair or less hair than dark-haired people? The answer is less. Red-haired people have about 90 000 hairs on their heads.

In this lesson you will increase your number sense for large whole numbers. You will use base ten blocks and pictures to show an understanding of place value. You will read and write large numbers in numerals and words. You will develop and apply estimation strategies.

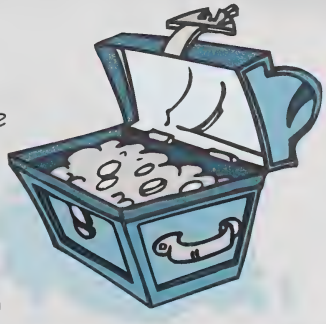
# Activity 1

Today you will use base ten blocks to help you visualize numbers and write numbers in numerals and words.

Kassidy and Connor read the following excerpt from Captain Quinn's journal.

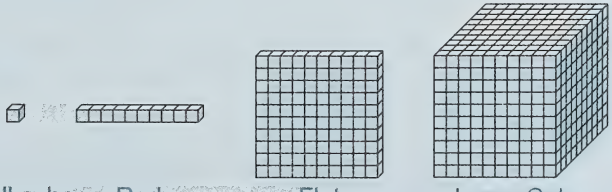
*Aye, mate! I've hidden treasure beyond your wildest dreams. In one location alone, there are 25 chests filled with doubloons.*

*- Captain Quinn*



You can represent the doubloons (old Spanish coins) with **base ten blocks**.

Base ten blocks are blocks used to represent numbers. There are four different kinds of base ten blocks.




Take out your set of base ten blocks and examine them.

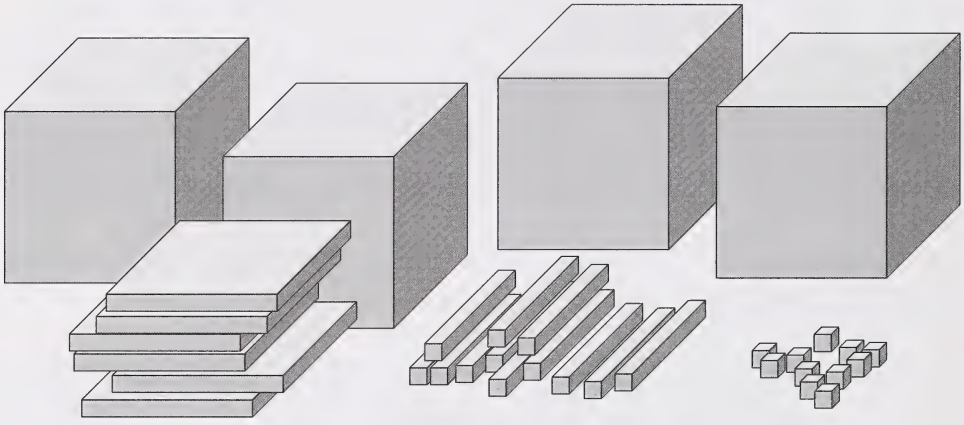
When these blocks are used to represent whole numbers, the blocks have the following values:

- Each small cube represents 1.
- Each rod represents 10.
- Each flat represents 100.
- Each large cube represents 1000.

**Note:** Base ten blocks come in different colours, but for work with whole numbers, the colour of the blocks is not important.

## Example

The following base ten blocks represent one sailor's share of the treasure.



The blocks represent approximately 5000 doubloons. (By quickly "eyeballing" the blocks, you can see that there are 4 thousands cubes and several other blocks—hundreds flats, tens rods, and ones cubes. The total is close to 5000.)

You can then make a table to find the actual number of doubloons represented. Once you've completed the table, you can write the number in numeral form and in words.

Work through the following steps to complete the table.

**Step 1:** Record the blocks given in the example.

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Blocks Given** | 4 | 6 | 12 | 11 |
| **Regrouped Blocks** | | | | |

**Step 2:** Examine the ones cubes. There are 11 ones. You must regroup (trade 10 ones for 1 ten). After regrouping you have 1 ones cube left.

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Blocks Given** | 4 | 6 | 12 + 1 | 11 |
| **Regrouped Blocks** | | | | 1 |

**Step 3:** Examine the tens rods. There are now 12 tens + 1 ten = 13 tens. You must regroup (trade 10 tens for 1 hundred). After regrouping you have 3 tens rods left.

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Blocks Given** | 4 | 6 + 1 | 12 + 1 = 13 | 11 |
| **Regrouped Blocks** | | | 3 | 1 |

**Step 4:** Examine the hundreds flats. There are now 6 hundreds + 1 hundred = 7 hundreds. No regrouping is required.

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Blocks Given** | 4 | 6 + 1 = 7 | 12 + 1 = 13 | 11 |
| **Regrouped Blocks** | | 7 | 3 | 1 |

**Step 5:** Examine the thousands cubes. There are 4 thousands. No regrouping is needed.

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Blocks Given** | 4 | 6 + 1 = 7 | 12 + 1 = 13 | 11 |
| **Regrouped Blocks** | 4 | 7 | 3 | 1 |

**Step 6:** Write the number of doubloons represented as a numeral.

Number of doubloons represented: 4731

**Number** is the concept of *how many*, *how long*, or *how much*. The symbol that is used to indicate the number is a **numeral**. A numeral can be made up of one or more **digits**. For example, the numeral 4731 has four digits.

**Step 7:** Write the number represented in words.

Number written in words: four thousand seven hundred thirty-one

**Note:** Don't include the word *and* in your answer.

1. Turn to page 46 of your textbook. Imagine that each of the pictures in questions 1, 2, and 3 of Visualizing Numbers represents a share of the treasure hidden by Captain Quinn. Record the information in a table like the one used in the previous example. Remember to show the blocks given and the regrouped blocks (if necessary). Then write the number as a numeral and write the number in words.

2. **a.** In question 1, why did you not regroup any of the thousands cubes?
   **b.** Explain when you would need to regroup the thousands cubes.

3. **a.** What is the least number of base ten blocks (no regrouping required) that you could use to represent 5840 doubloons? Explain.

   **b.** What is the greatest number of base ten blocks (regrouping required) that you could use to represent 5840 doubloons? Explain.

4. Turn to page 18 in your Practice and Homework book and complete the page.

Check your answers on pages 79 and 80 in the Appendix.

## Sharing Time

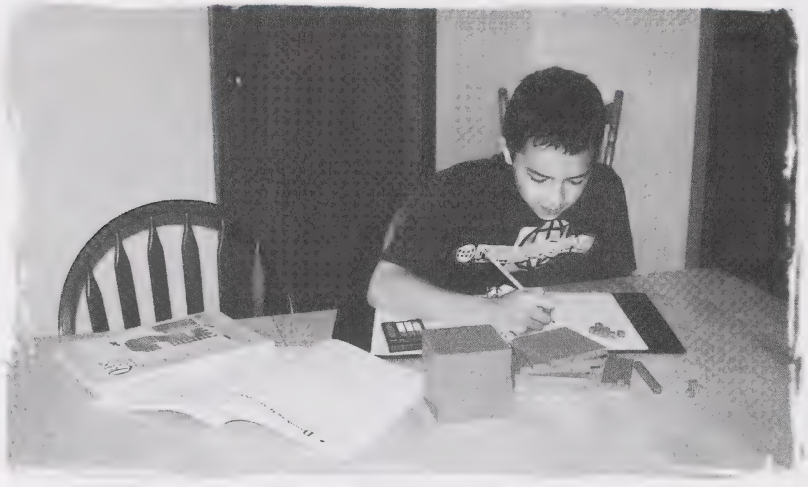
Now it's time to discuss what you have been learning with your home instructor.

Complete some of the questions on page 19 in your Practice and Homework Book.

Your home instructor will help you decide how many questions you should do and will check your answers when you finish.

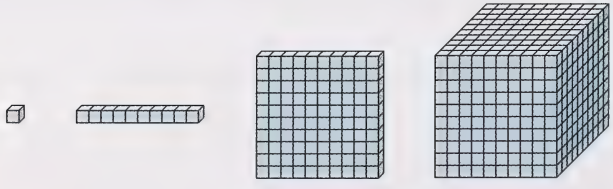
# Activity 2

Today you will represent four-digit and five-digit numbers in different ways.

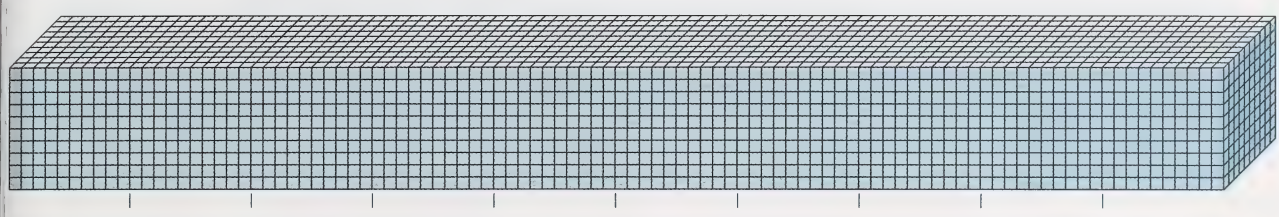


Base ten blocks were invented by the mathematician Zoltan P. Dienes because he wanted to help students better understand place value in our base ten number system. There is no base ten block that represents ten thousands or hundred thousands. However, you can picture mentally what the models of ten thousands and hundred thousands might look like.

Take out your set of base ten blocks and examine the ones cube, the tens rod, the hundreds flat, and the thousands cube. Notice that each base ten block is 10 times the size of the previous block.



If you extend the pattern, the model for ten thousands will be a "super rod" made by connecting 10 thousands cubes.



1. **a.** Picture in your mind (visualize) the model for one hundred thousand and describe what it would look like.

   **b.** If the block that represents ten thousand was called a "super rod," what might you call the block that represents one hundred thousand?

2. **a.** Suppose that Captain Quinn's treasure totalled 289 432 doubloons. Copy and complete a table like the following to show how many base ten blocks you would need to represent the treasure if you were using only thousands cubes, hundreds flats, tens rods, and ones cubes.

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Base Ten Blocks Needed** | | | | |

   **b.** Copy and complete a table like the following to show how many base ten blocks you would need if you were also using "super rods."

| | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| **Base Ten Blocks Needed** | | | | | |

c. Copy and complete a table like the following to show how many base ten blocks you would need if you were also using "super flats."

| | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|---|
| Base Ten Blocks Needed | | | | | | |

Check your answers on pages 80 and 81 in the Appendix.

Captain Quinn's treasure totalled 289 432 doubloons. Here, the number is written in **standard form**.

Standard form is the usual numeral form of the number.

When you write larger numbers in standard form, you leave a space between each set of three digits, called **triads**.

For a six-digit number like 289 432, the left triad (289) represents the number of thousands, and the right triad (432) represents the number of ones.

| | Thousands | | | Ones | | |
|---|---|---|---|---|---|---|
| | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
| Base Ten Blocks Needed | 2 | 8 | 9 | 4 | 3 | 2 |

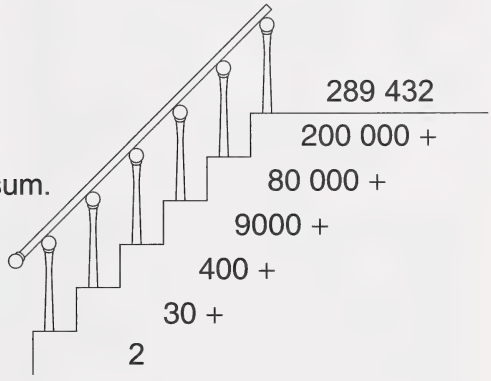
The number 289 432 is read as "two hundred eighty-nine thousand four hundred thirty-two."

The number 289 432 can be written in **expanded** form.

When you write a number in expanded form, you show the place value of each digit.

$$\begin{aligned} 289\,432 &= 2 \text{ hundred thousands} + 8 \text{ ten thousands} + 9 \text{ thousands} + \\ &\quad 4 \text{ hundreds} + 3 \text{ tens} + 2 \text{ ones} \\ &= (2 \times 100\,000) + (8 \times 10\,000) + (9 \times 1000) + (4 \times 100) + (3 \times 10) + (2 \times 1) \\ &= 200\,000 + 80\,000 + 9000 + 400 + 30 + 2 \end{aligned}$$

The expanded form of a number is a sum.




**3.** For each of the following, copy and complete the given table.

**a.**

| | Thousands | | | Ones | | |
|---|---|---|---|---|---|---|
| | **Hundred Thousands** | **Ten Thousands** | **Thousands** | **Hundreds** | **Tens** | **Ones** |
| **Base Ten Blocks Given** | 4 | 12 | 16 | 14 | 8 | 11 |
| **Regrouped Blocks** | | | | | | |
| **Number of doubloons represented:** | | | | | | |
| **Number written in words:** | | | | | | |
| **Number written in expanded form:** | | | | | | |

**b.**

| | Thousands | | | Ones | | |
|---|---|---|---|---|---|---|
| | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
| Base Ten Blocks Given | 7 | 18 | 18 | 18 | 19 | 12 |
| Regrouped Blocks | | | | | | |
| Number of doubloons represented: | | | | | | |
| Number written in words: | | | | | | |
| Number written in expanded form: | | | | | | |

**c.**

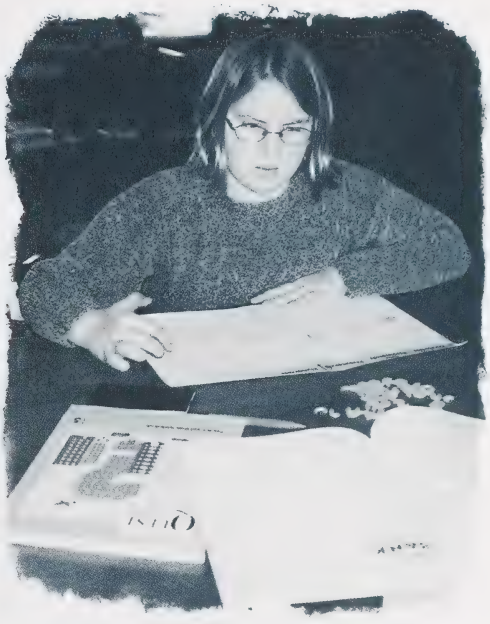
| | Thousands | | | Ones | | |
|---|---|---|---|---|---|---|
| | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
| Base Ten Blocks Given | 3 | 12 | 8 | 24 | 17 | 31 |
| Regrouped Blocks | | | | | | |
| Number of doubloons represented: | | | | | | |
| Number written in words: | | | | | | |
| Number written in expanded form: | | | | | | |

**4.** Turn to page 20 of your Practice and Homework Book and complete questions 6 to 11.

Check your answers on pages 81 and 82 in the Appendix.

# Activity 3

Today you will continue to work with four-digit and five-digit numbers.



Since it is not always possible to use base ten blocks to represent large numbers, you can use counters and place-value charts. The counters may be macaroni, dried beans or corn, bingo chips, buttons, bread tags, coins, or any other small objects.

Take the place-value chart out of the Cut-Out Learning Aids section of the Appendix, gather some counters, and work through the following example.

## Example

Put counters on the place-value chart to represent the number 309 472. Then write the number in expanded form and in words.

| Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| ●●● | | ●●●●● ●●●● | ●●●● | ●●●●● ●● | ●● |
| **Number written in expanded form:** 300 000 + 9000 + 400 + 70 + 2 | | | | | |
| **Number written in words:** three hundred nine thousand four hundred seventy-two | | | | | |

Notice that zero is used as a place holder in the number 309 472.

1. Represent each of the following numbers by placing counters on the place-value chart. Then write each number in expanded form and in words.

   **a.** 472 173 **b.** 306 527 **c.** 963 028

2. **a.** How is using counters on a place-value chart the same as using base ten blocks?

   **b.** How is using counters on a place-value chart different from using base ten blocks?

Check your answers on pages 83 and 84 in the Appendix.

You have discovered that in our base ten number system, a digit's value depends on its place in a numeral.

3. Complete questions 1 to 12 on page 22 of your Practice and Homework Book.

Check your answers on page 84 in the Appendix.

You are now ready to use your knowledge of place value to do some problem solving.

4. Turn to page 49 of your textbook. List all the possible answers for question 1 of On Your Own. Show your work and explain your reasoning.

Check your answers on pages 84 and 85 in the Appendix.

# Activity 4

Today you will use estimation strategies.

Habib was struggling to open a large bag of rice. Suddenly, the bag tore down the side and rice spilled everywhere! Just as Habib was finished sweeping the rice into a neat pile, his sister, Shamim, came into the kitchen. She grabbed an empty 1-L milk carton from the recycling bin and helped Habib pick up the rice and put it in the carton. The carton turned out to be just the right size—the rice came right up to the top. Shamim exclaimed, "So, that's what a thousand grains of rice looks like!"

**1. a.** Do you think Shamim's estimate of the number of grains of rice in the 1-L carton is reasonable? Explain why or why not.

**b.** Tell what you would do to decide how many grains of rice are needed to fill a 1-L milk carton.

Check your answers on page 85 in the Appendix.

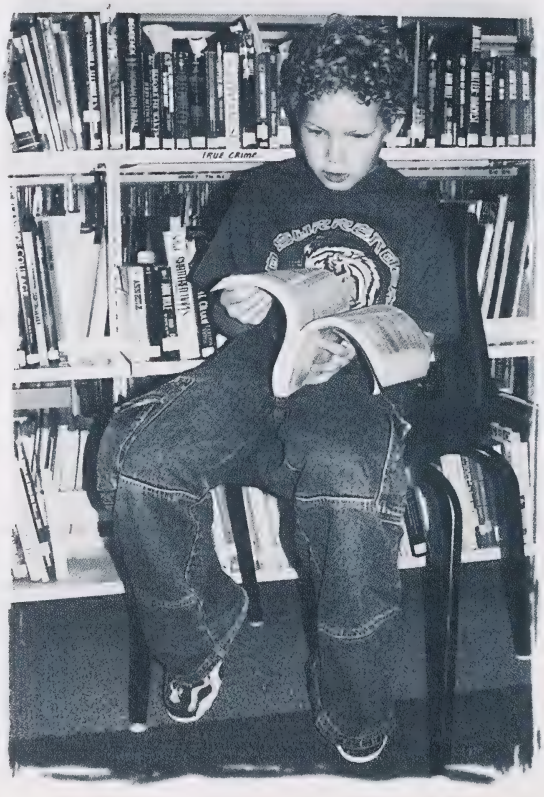
Are you ready for more estimation questions?

If you have access to the Internet, go to the following website:

**http://www.figurethis.org/challenges/challenge_index.htm**

Click on Line Up! Think of a strategy to answer the Line Up problem. Then carry out the strategy. **Note:** You may use a calculator to help you make the estimate. Click on Answer and compare your estimate and reasoning to the given solution. Click on Did You Know? to discover some interesting facts about Line Ups.

**2.** Explain a strategy to estimate the number of names in your telephone book.




Check your answer on pages 85 and 86 in the Appendix.

## Sharing Time

Now it's time to discuss with your home instructor what you have been learning.

Explain to each other a strategy to estimate the number of weeds on a lawn.

## Challenge Activity

Have you ever noticed that the construction date of a public building is often written in Roman numerals on its cornerstone?

Following are some other situations where Roman numerals are used today:

- Monarchs are usually numbered using Roman numerals. For example, you may have read about King Edward VII of England or Louis XIV of France.

- The Olympic Games are numbered using Roman numerals. For example, the 1996 Olympic Games at Atlanta, Georgia, were called the XXVI Olympic Games. This means they were the 26th games of the modern era.

- The copyright dates on films and television programs are written in Roman numerals. For example, if you saw MCMLXXXVI at the end of a film, it would mean that the film was produced in 1986.

Turn to page 52 of your textbook and read about Roman numerals (up to the dotted line).

Did you notice the following facts about Roman numerals?

- The seven basic symbols in the Roman numeral system are capital letters.

| | | |
|---|---|---|
| I = 1 | V = 5 | X = 10 |
| L = 50 | C = 100 | D = 500 |
| M = 1000 | | |

- If a letter in a Roman numeral is immediately followed by a letter of lesser value, the values are added.

| | |
|---|---|
| VI = 5 + 1 | XI = 10 + 1 |
| = 6 | = 11 |

- If a letter in a Roman numeral is immediately followed by a letter of greater value, the lesser value is subtracted from the greater value.

| | |
|---|---|
| IV = 5 – 1 | IX = 10 – 1 |
| = 4 | = 9 |

**1.** The Roman numerals for base ten numerals 1 to 20 are shown on page 52 in your textbook. Continue the list by writing the Roman numerals for base ten numerals 21 to 50.

2. **a.** Write the Roman numerals for 60, 70, 80, and 90.

   **b.** Write the Roman numerals for 100, 200, 300, 400, 500, 600, 700, 800, and 900.

   **c.** Write the Roman numerals for 1000, 2000, and 3000.

Check your answers on page 86 in the Appendix.

The Romans used an **abacus** to represent and calculate numbers.

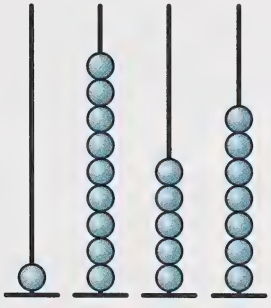
An abacus is a counting device made up of a frame holding rods that are strung with movable beads.

Work through the following example.

## Example

For each of the following Roman numerals, there is an abacus model of the number. The matching base ten numeral is written below each model.

MCMLVII

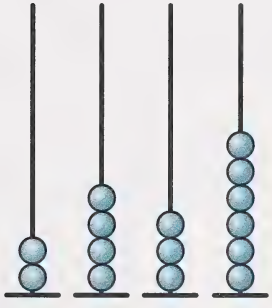


$= M + CM + L + VII$

$= 1000 + 900 + 50 + 7$

$= 1957$

MMCDXXXVI



$= MM + CD + XXX + VI$

$= 2000 + 400 + 30 + 6$

$= 2436$

3. For each of the following Roman numerals, draw an abacus model and then write the matching base ten numeral.

   **a.** MDXLIX **b.** MMMCCCLXXV **c.** MMCMLXXXIII

4. Explain how Roman numerals are different from base ten numerals.

Check your answers on pages 86 and 87 in the Appendix.

For additional information on Roman numerals, do some research on the Internet. You may find the following site helpful. **Note:** Click on the forward arrow (arrow on the right) to move to the next page.

**http://www.beaconlc.org/sandiking/King/RomanNumerals/roman_numerals.htm#page5**

The following site has a handy Roman numeral converter that you may find useful.

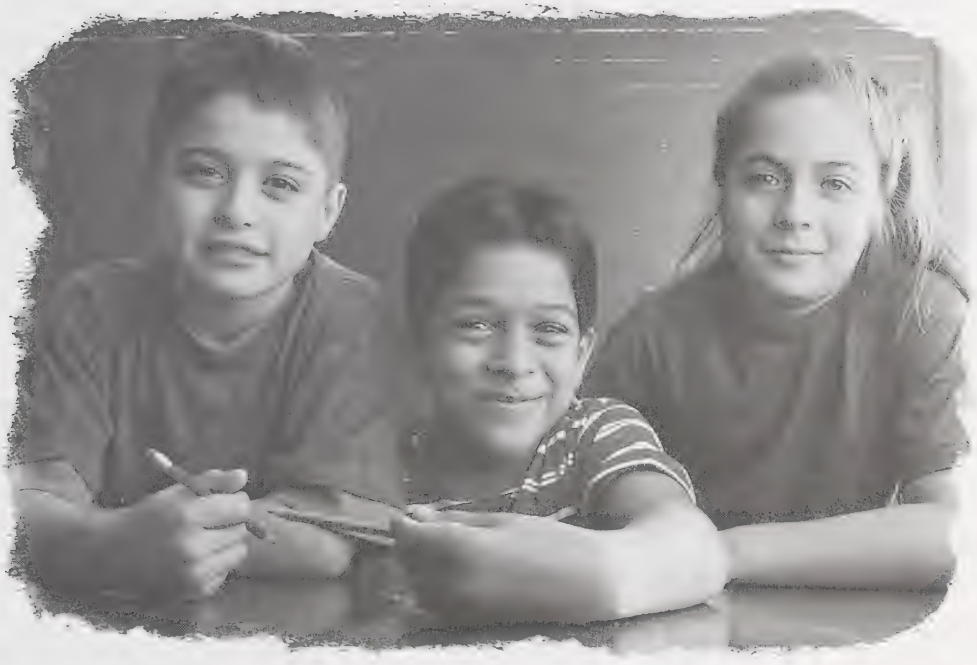
**http://www.novaroma.org/via_romana/numbers.html**

# Conclusion

In this lesson you demonstrated a number sense for large whole numbers and place value. You read and wrote large numbers in numerals and words. You developed and applied estimating strategies.

In this section you discovered that people with blond hair have about 140 000 hairs on their heads.

What estimation strategy do you think researchers used to determine the number of hairs on a person's head?



Turn to Assignment Booklet 1A and complete the Lesson 1 Assignment.

Keep Assignment Booklet 1A until you have completed the entire booklet.

# Lesson 2

## Comparing and Ordering

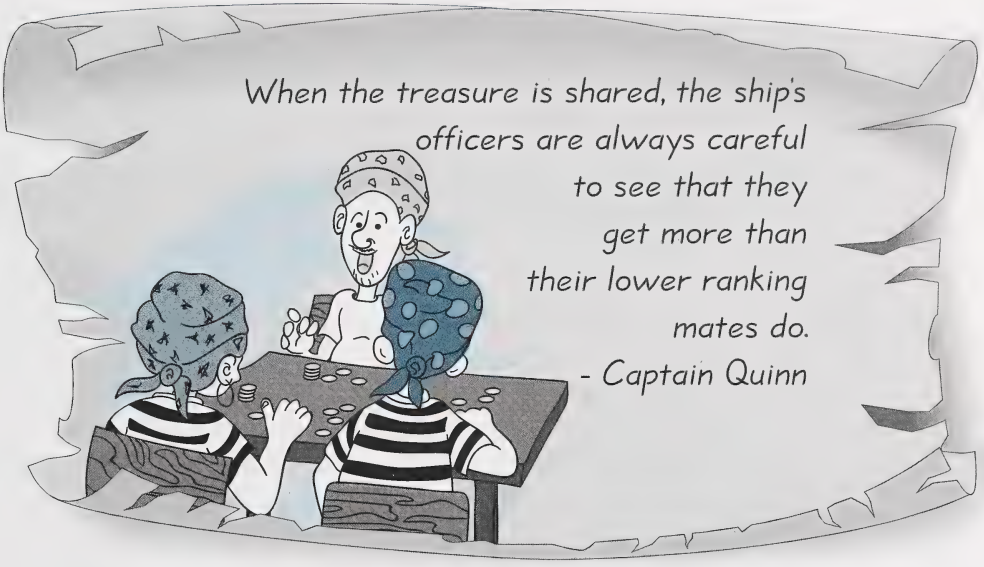
Did you know that Edmonton, the capital of Alberta, grew in area about seven times in the fifty years following the 1947 Leduc oil find? In 1947 Edmonton's area was approximately 100 $km^2$. In 1997 it was about 700 $km^2$. Moreover, the population grew from 118 541 people in 1947 to 624 000 people in 1997.

In what community do you live? Do you know the population and area of your community? How does its population and area compare to Edmonton and other communities?

In this lesson you will use your knowledge of place value to compare and order large numbers.

# Activity 1

Today you will compare and order numbers.


When the treasure is shared, the ship's officers are always careful to see that they get more than their lower ranking mates do.
- Captain Quinn

1. Use your place-value chart and counters to help you answer the following questions. For each crew member's share of doubloons, draw the resulting place-value chart and write the number of doubloons as a numeral.

   a. Turn to page 47 of your textbook. The picture shown in question 3 of On Your Own represents the cook's share. What was the cook's share?

   b. The quartermaster's share was 3000 doubloons less than the cook's share. What was the quartermaster's share?

   c. The first mate's share was 700 doubloons greater than the cook's share. What was the first mate's share?

   d. The second mate's share was 40 doubloons less than the cook's share. What was the second mate's share?

**e.** The navigator's share was 8 doubloons greater than the cook's share. What was the navigator's share?

**2.** **a.** Which crew member received the most doubloons?
**b.** Which crew member received the least doubloons?
**c.** Order the shares from least to greatest.

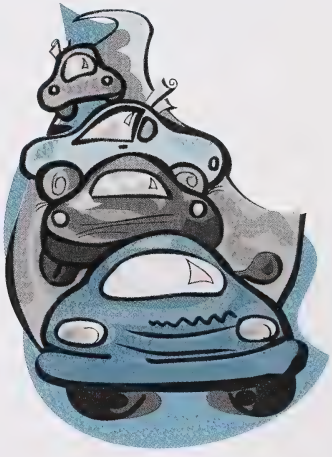
**3.** Turn to page 22 of your Practice and Homework Book and complete questions 13 to 24.

Check your answers on pages 87 and 88 in the Appendix.

## Activity 2

Today you will extend your skills of comparing and ordering whole numbers.

People who wish to save money often spend time comparing prices. Comparing prices is especially important when purchasing an expensive item, such as an automobile.



**1.** Turn to pages 43 to 45 of your textbook and answer questions 1 and 2 of Starting Out.

Check your answers on page 89 in the Appendix.

You must use your knowledge of place value when you compare and order numbers.

**2.** Turn to pages 56 and 57 of the textbook and answer questions 1, 2.a., 2.b, and 6.

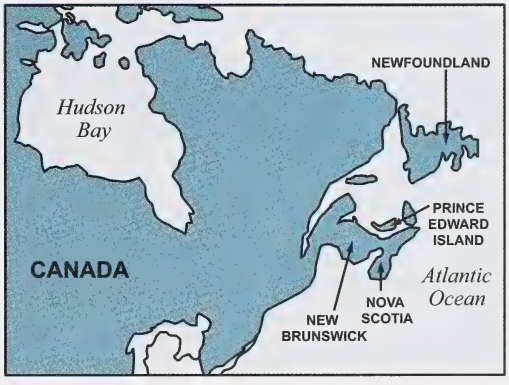
Check your answers on pages 89 and 90 in the Appendix.

# Activity 3

Today you will extend your skills of comparing and ordering numbers.

Have you ever travelled to Atlantic Canada?

The following table shows the population of each of the Atlantic provinces from 1996 to 2000.




| | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| **Newfoundland** | 560 600 | 554 100 | 545 400 | 540 800 | 538 800 |
| **Prince Edward Island** | 136 200 | 136 900 | 136 900 | 137 600 | 138 900 |
| **Nova Scotia** | 931 200 | 934 500 | 936 100 | 939 200 | 941 000 |
| **New Brunswick** | 753 000 | 754 200 | 753 400 | 754 300 | 756 000 |

The population of Newfoundland was 560 600 in 1996, and it was 538 800 in 2000. Was the population of Newfoundland greater in 1996 or 2000?

There are several ways to answer this question.

Kassidy uses a place-value chart to compare the numbers. She works from the left and compares the digits in each place.

| | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|---|
| 1996 | 5 | 6 | 0 | 6 | 0 | 0 |
| 2000 | 5 | 3 | 8 | 8 | 0 | 0 |

Kassidy notices that the digits in the hundred thousands place are the same. She then looks at the ten thousands place and notices that 6 is greater than 3. She reasons that 560 600 is greater than 538 800, and the population of Newfoundland was greater in 1996 than in 2000.

Connor also uses a place-value chart to compare the numbers, but he compares the first **triad** in each number.

| | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|---|
| 1996 | 5 | 6 | 0 | 6 | 0 | 0 |
| 2000 | 5 | 3 | 8 | 8 | 0 | 0 |

Connor notices that 560 thousand is greater than 538 thousand. He reasons that 560 600 is greater than 538 800, and the population of Newfoundland was greater in 1996 than in 2000.

1. Use the population data on page 37 to answer the following questions.

   a. Which Atlantic province had the greater population in 2000, Nova Scotia or New Brunswick?

   b. Did Prince Edward Island have more population in 1998 or 1999?

   c. Did Newfoundland have less population in 1997 or 1999?

2. a. The population data on page 37 was rounded to the nearest hundred. Use the data for 2000 and round the population of each province to the nearest hundred thousand.

   b. Write the Atlantic provinces in order from least population to greatest population in 2000.

3. Complete questions 1 to 5 on page 20 of your Practice and Homework Book.

Check your answers on pages 90 and 91 in the Appendix.

## Sharing Time

Now it's time to show your home instructor what you have been learning.

Play the game on either page 21 or page 23 in your Practice and Homework Book. You may play both games if you wish.

# Challenge Activity

*Crew members sew different colours of stars on their duffle bags to show how far they have sailed in their lifetime. They start by collecting blue stars, one for each 1000 km travelled. When they reach 10 000 km, they stop collecting blue stars and begin collecting red stars (one red star for each 10 000 km). When they reach 100 000 km, they stop collecting red stars and begin collecting gold stars (one gold star for each 100 000 km).*

*After each voyage, the first mate updates each sailor's log book and records the total kilometres travelled, and I award additional stars as they are earned. I allow my crew members to display their next star as long as they have travelled at least half the number of kilometres needed to earn the star.*

*- Captain Quinn*

Following are three examples.

## Example 1

Slimy's log book shows 6734 km. This distance can be rounded to the nearest thousand, so the highest colour of stars he can display is blue. Because 6734 rounded to the nearest thousand is 7000, Slimy's duffle bag has 7 blue stars.

## Example 2

Buckle's log book shows 23 587 km. This distance can be rounded to the nearest ten thousand, so the highest colour of stars he can display is red. Because 23 587 rounded to the nearest ten thousand is 20 000, Buckle's duffle bag has 2 red stars.

## Example 3

Sharky's log book shows 825 342 km. This distance can be rounded to the nearest hundred thousand, so the highest colour of stars he can display is gold. Because 825 342 rounded to the nearest hundred thousand kilometres is 800 000, Sharky's duffle bag has 8 gold stars.

**1.** Copy and complete the following table.

| Name | Total Kilometres Travelled | Highest Colour of Stars Displayed | Number of Highest Colour Stars |
|---|---|---|---|
| **Slimy** | 6734 | blue | 7 |
| **Buckle** | 23 587 | red | 2 |
| **Sharky** | 825 342 | gold | 8 |
| **Black Beard** | 85 710 | | |
| **Rusty** | 260 196 | | |
| **Bob** | 7142 | | |
| **Peg Leg** | 366 145 | | |
| **Iron Man** | 9501 | | |

2. If a sailor displayed 2 red stars on his duffle bag, could you tell exactly how far he sailed? Explain.

3. For each of the following sets of stars, give the least possible kilometres travelled and the greatest possible kilometres travelled.

   **a.** 3 gold stars **b.** 9 blue stars **c.** 5 red stars

Check your answers on pages 91 and 92 in the Appendix.

## Conclusion

In this lesson you used your knowledge of place value to compare and order large numbers. Some of the numbers you used were exact and others were approximations.

You discovered that the population of Edmonton grew from 118 541 in 1947 to 624 000 in 1997. In the same time period, the area of Edmonton grew from 100 $km^2$ to 700 $km^2$.

Which of these numbers are exact? Which are approximations?

Turn to Assignment Booklet 1A and complete the Lesson 2 Assignment.

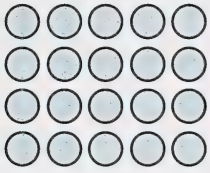
When you are done, send Assignment Booklet 1A to your distance learning teacher to be marked.

# Just the Facts, Please!

How well do you remember your multiplication facts? You may have forgotten some of them if you haven't practised them for a while. If you are rusty, don't be discouraged. You will improve with practice.

Here's a tip about multiplication facts.

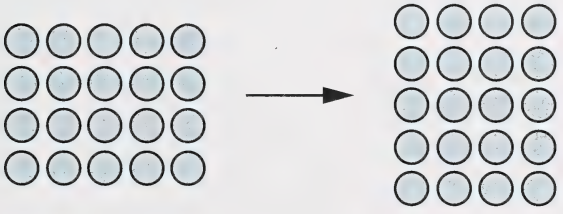
Suppose you remember that $4 \times 5 = 20$. Can that help you learn the answer to $5 \times 4$? You bet it can! Remember that one way to visualize multiplication is to picture an array. Picture $4 \times 5$ as an array that has 4 rows with 5 counters in each row, as shown below.



$4 \times 5 = 20$

There are 20 counters in all.

Give the page a quarter turn. Now you see an array that has 5 rows with 4 counters in each row.



$5 \times 4 = 20$

There are still 20 counters in all.

This shows you that $4 \times 5 = 5 \times 4$.

Try doing this with some other arrays. You will see that if you switch the order of factors when you multiply, you still get the same answer. So, when learning the multiplication facts, you get a two-for-one deal!

Multiplying by 1, 0, and 10 is easy. By switching the factors when you multiply, you only have to remember the highlighted facts.

| × | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **1** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **2** | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| **3** | 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| **4** | 0 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| **5** | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| **6** | 0 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| **7** | 0 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| **8** | 0 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| **9** | 0 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| **10** | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

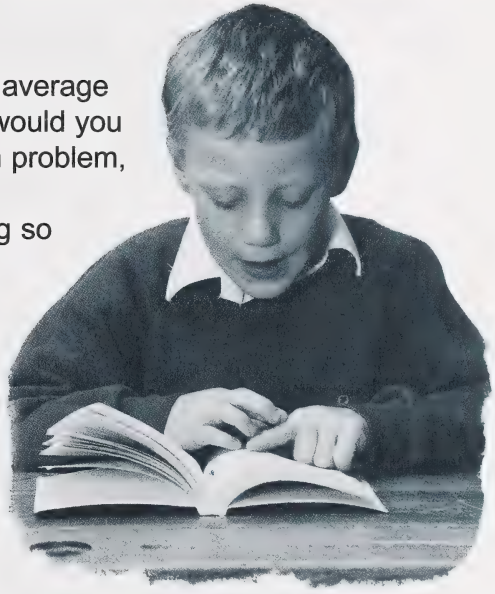
Review these facts regularly. The amount of time you should spend practising will depend on how many of the facts you know.

There are many games for practising the multiplication facts on the following website:

**http://www.multiplication.com**

# Lesson 3

## Multiplication

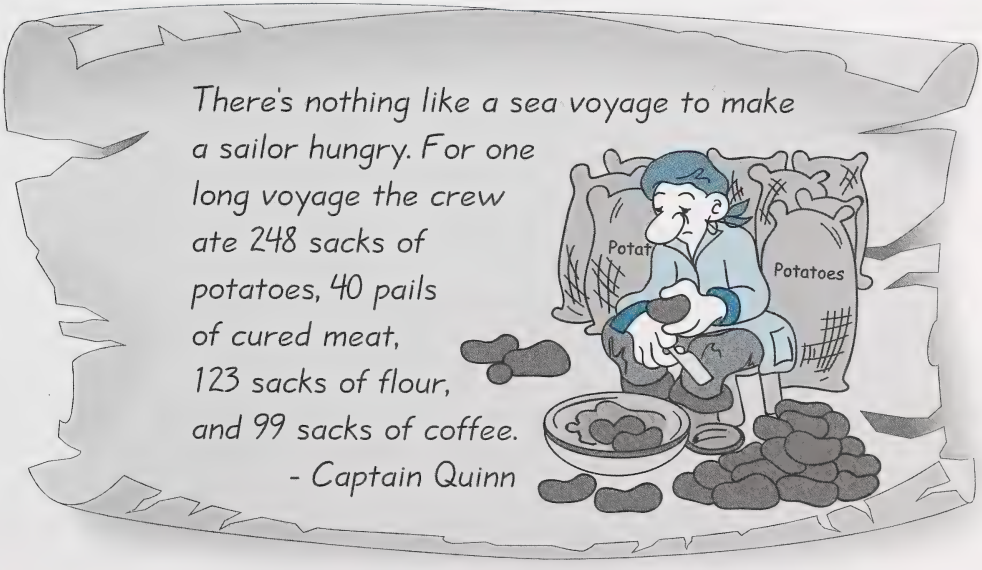


Do you enjoy reading? If you read an average of 35 pages a day, how many pages would you read in a year? This is a multiplication problem, isn't it? When multiplying, it is wise to estimate the answer before calculating so you will know if your answer makes sense.

In this lesson you will learn a variety of strategies for estimating products and for calculating the exact answer.

## Activity 1

Today you will estimate products.


There's nothing like a sea voyage to make a sailor hungry. For one long voyage the crew ate 248 sacks of potatoes, 40 pails of cured meat, 123 sacks of flour, and 99 sacks of coffee.
- Captain Quinn
Potat
Potatoes

Captain Quinn's crew ate 248 sacks of potatoes on one long voyage. If each sack cost 37 doubloons, estimate the total cost of the potatoes.

Three estimation methods are shown:

- **Rounding**

  Round each number to its nearest place value. For example, 37 rounded to the nearest ten is 40 and 248 rounded to the nearest hundred is 200.

  Think $37 \times 248 \doteq 40 \times 200$
  $\doteq 8000$

  $\doteq$ means "approximately equal to."

  The total cost of the potatoes is about 8000 doubloons.

- **Front-end digits**

  Use the first digit in each number and make the other digits zeros. For $37 \times 248$, you would use $30 \times 200$.

  Think $37 \times 248 \doteq 30 \times 200$
  $\doteq 6000$

  The total cost of the potatoes is about 6000 doubloons.

  **Note:** Because both estimated factors are less than the exact factors, a front-end estimate for multiplication will always be lower than the actual answer.

- **Compensating**

  Round one number down and the other number up. For example, round 37 down to 30 and round 248 up to 300.

  Think $37 \times 248 \doteq 30 \times 300$
  $\doteq 9000$

  The total cost of the potatoes is about 9000 doubloons.

Do the following questions.

1. Jill bought 26 packages of cookies for a community picnic. If each package contained 34 cookies, how many cookies did she buy in all?

   **a.** Estimate the answer. Show your method.
   **b.** Write the exact answer you get using your calculator.

2. How many hours are there in one leap year?

   **a.** Estimate the answer. Show your method.
   **b.** Write the exact answer you get using your calculator.

3. For the operation $35 \times 98$, complete the following questions.

   **a.** Describe a situation where you would only need an estimate.
   **b.** Describe a situation where you would need the exact answer.
   **c.** Estimate the answer. Show your method.
   **d.** Write the exact answer you get using your calculator.

Check your answers on pages 92 and 93 in the Appendix.

## Sharing Time

Now it's time to show your home instructor what you are learning.

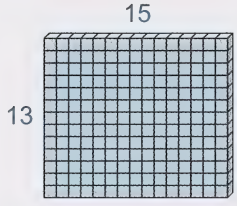
Play the game on page 35 of the Practice and Homework Book. Use estimation strategies when choosing the numbers. You may then use a calculator to find the products.

# Activity 2

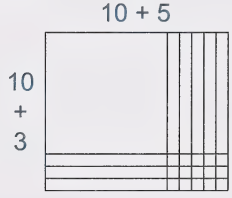
Today you will model products with rectangular arrays. These models will help you understand the concept of multiplying by a two-digit number.

Captain Quinn's cook decided that 15 sacks of flour would probably be used each week at sea. How many sacks must be stocked for a 13-week voyage?

You can illustrate this problem by building a 13 by 15 rectangular array of ones cubes.

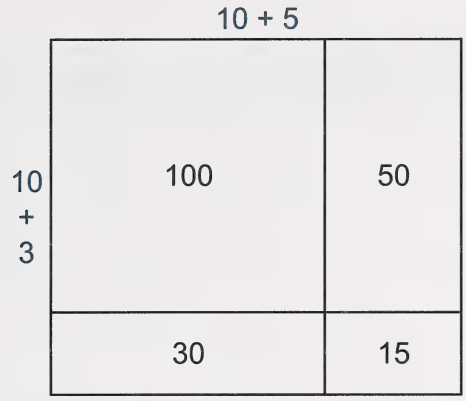



Because using only ones cubes is time-consuming, you could build a rectangle of flats, rods, and small cubes instead.




The length of the rectangle is written as $10+5$, and the width is written as $10+3$.

You can sketch the model like this and record the four partial products.



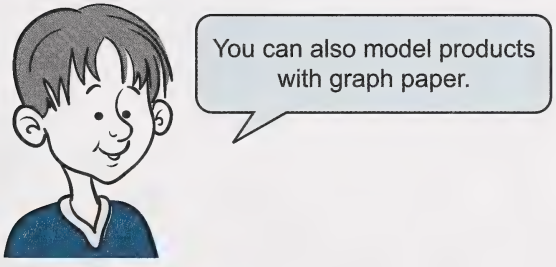

$10 \times 10 = 100$
$10 \times 5 = 50$
$3 \times 10 = 30$
$3 \times 5 = 15$

The sum of the partial products is 195. Therefore, $13 \times 15 = 195$.

**1.** Use base ten blocks to show the following products. Then sketch each model in your notebook and write a mathematical expression that shows the solution.

**a.** $11 \times 42$ **b.** $19 \times 24$ **c.** $25 \times 33$

Check your answers on page 93 in the Appendix.



Turn to page 71 of the textbook and study the pictures in Modelling Multiplication.

Notice that $13 \times 15$ is modelled two ways on page 71 of your textbook. In the top example, there are four areas and four partial products. In the lower example, there are two areas and two partial products. Both models show that the product is 195.

2. Turn to page 72 of your textbook and answer questions 1 to 3 of On Your Own.

Check your answers on page 94 in the Appendix.

## Sharing Time

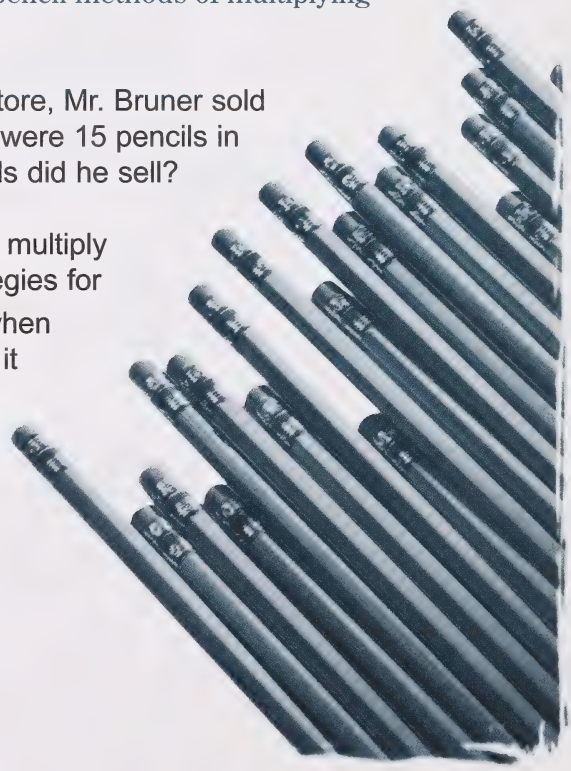
Now it's time to show your home instructor what you have been learning.

Complete page 33 in your Practice and Homework Book. Your home instructor will help you check your answers.

# Activity 3

Today you will use paper-and-pencil methods of multiplying whole numbers.

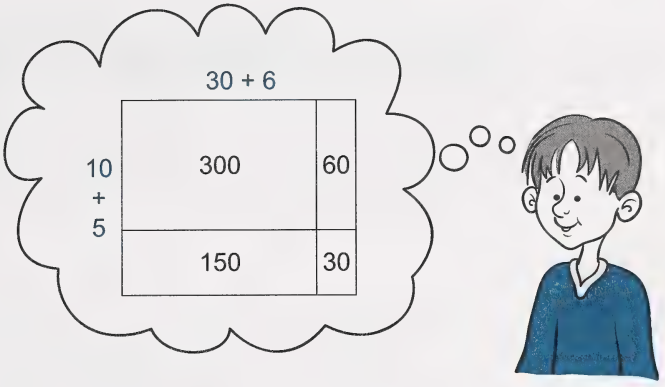
During a sale at his stationery store, Mr. Bruner sold 36 packages of pencils. If there were 15 pencils in each package, how many pencils did he sell?



To solve this problem, you must multiply 36 by 15. There are many strategies for calculating $36 \times 15$. However, when multiplying two whole numbers, it may be helpful to picture in your mind an array separated into smaller arrays. This will help you know which partial products must be added together.

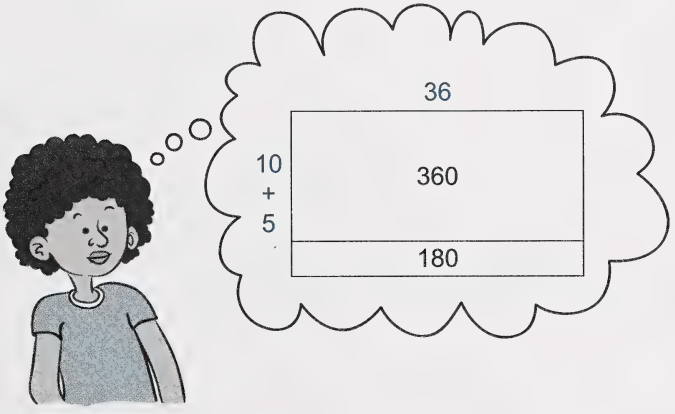
Connor multiplied the parts of 36 by 10. Then, he multiplied the parts of 36 by 5.

$$\begin{array}{rr} & 36 \\ \times & 15 \\ \hline 10\times 30 = & 300 \\ 10\times 6 = & 60 \\ 5\times 30 = & 150 \\ 5\times 6 = & 30 \\ \hline & 540 \end{array}$$




Mr. Bruner sold 540 pencils.

Kassidy multiplied the parts of 36 by 15.




$$\begin{array}{rr} & 36 \\ \times & 15 \\ \hline 10\times 36 = & 360 \\ 5\times 36 = & 180 \\ \hline & 540 \end{array}$$

Mr. Bruner sold 540 pencils.

1. For each of the following products, first estimate the answer. (Show how you made the estimate.) Then, find the exact answer.

   **a.** How many players are needed to form 26 teams with 12 players on each team?

   **b.** What is the total cost to buy 38 tickets to a hockey game if each ticket costs $63?

**c.** How many kilometres did Ruth's family travel in January if they travelled an average of 76 km per day?

Check your answers on page 95 in the Appendix.

So far in this activity, you have multiplied a pair of two-digit whole numbers. You can use the same strategy when multiplying a three-digit number by a two-digit number.

Turn to page 144 of your Practice and Homework Book and study the first two examples. (The examples are boxed and numbered 1 and 2.)

In the first example, the parts of 768 are multiplied by 10 and then by 2. You can also show the product in the following way:

$$
\begin{array}{rr}
 & 768 \\
 & \times\ 12 \\
\hline
10\times 700 = & 7000 \\
10\times 60 = & 600 \\
10\times 8 = & 80 \\
2\times 700 = & 1400 \\
2\times 60 = & 120 \\
2\times 8 = & 16 \\
\hline
 & 9216
\end{array}
$$

| | 700 + 60 + 8 | | |
|---|---|---|---|
| 10 + 2 | 7000 | 600 | 80 |
| | 1400 | 120 | 16 |

In the second example, the parts of 768 are multiplied by 12. You can also show the product in the following way:

$$
\begin{array}{rr}
 & 768 \\
 & \times\ 12 \\
\hline
12\times 700 = & 8400 \\
12\times 60 = & 720 \\
12\times 8 = & 96 \\
\hline
 & 9216
\end{array}
$$

| | 700 + 60 + 8 | | |
|---|---|---|---|
| 12 | 8400 | 720 | 96 |

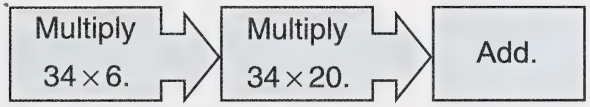
**2.** Show how you can multiply 768 by the parts of 12.

3. Turn to page 34 in your Practice and Homework Book and complete questions 2 to 4.

Check your answers on pages 96 and 97 in the Appendix.

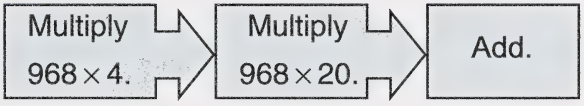
There is another strategy that many people use for multiplying two whole numbers.

**Example 1:** Multiply $34 \times 26$.




| | | |
|---|---|---|
| 34 | 34 | 34 |
| × 26 | × 26 | × 26 |
| 204 | 204 | 204 |
| | 680 | 680 |
| | | 884 |

**Example 2:** Multiply $968 \times 24$.




| | | |
|---|---|---|
| 968 | 968 | 968 |
| × 24 | × 24 | × 24 |
| 3872 | 3 872 | 3 872 |
| | 19 360 | 19 360 |
| | | 23 232 |

4. Turn to page 74 of the textbook and answer question 2 of Practise Your Skills.

Check your answers on page 97 in the Appendix.

## Sharing Time

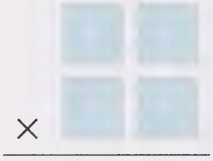
Now it's time to show your home instructor what you have been learning.

Turn to pages 38 and 39 in your Practice and Homework Book. Do questions 1, 2, and 3 on page 38. Then ask your home instructor to do questions 1, 2, and 3 on page 39. Explain your strategies to each other.

## Challenge Activity

Do you enjoy puzzles? If so, you will enjoy today's activity.

Many products can be formed by placing the digits 1, 3, 5, and 8 in various positions in the boxes.



1. **a.** What is the greatest possible product?
   **b.** Explain your strategy.

2. **a.** What is the least possible product?
   **b.** Explain your strategy.

3. **a.** How many different products can you make?
   **b.** Explain your strategy.

Check your answers on pages 97 and 98 in the Appendix.

# Conclusion

In this lesson you used a variety of strategies for estimating and calculating products.

Suppose you started reading books when you were ten years old. You read 35 pages a day. How many pages would you read in a week? a month? a year? About how old would you be when you finished reading 100 000 pages?

Turn to Assignment Booklet 1B and complete the Lesson 3 Assignment.

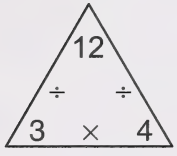
Keep Assignment Booklet 1B until you have completed the entire booklet.

# Just the Facts, Please!

How well do you remember your multiplication and division facts? Here's a tip on how to practise these facts.

You can organize your multiplication and division facts in sets of four related sentences. For example, there are four facts that connect 3, 4, and 12.

$3 \times 4 = 12$ $4 \times 3 = 12$ $12 \div 3 = 4$ $12 \div 4 = 3$




You can put all four of these facts onto one triangular card. To use this triangle card to practise multiplication facts, cover the 12 with your thumb. Read the multiplication questions from left to right $(3 \times 4)$ or from right to left $(4 \times 3)$. After you say the answer, move your thumb away to check your answer.

To use this triangle card to practise division facts, cover the 3 or the 4 with your thumb. Read the division question from top to bottom on the left $(12 \div 3)$ or the right $(12 \div 4)$. After you say the answer, move your thumb away to check your answer. Using the card will remind you that knowing one of these facts helps you to know the other three. Now, that's a four-for-one deal!

Make similar triangle cards for the other basic facts.

**Note:** Do not use these cards for the "zero" facts. Dividing by zero is a mathematical "no no."

Practise these facts regularly. The amount of time you should spend practising will depend on how many of the facts you know.

There are games for practising the multiplication and division facts on the following website:

**http://www.quia.com/dir/math**

# Lesson 4

## Division

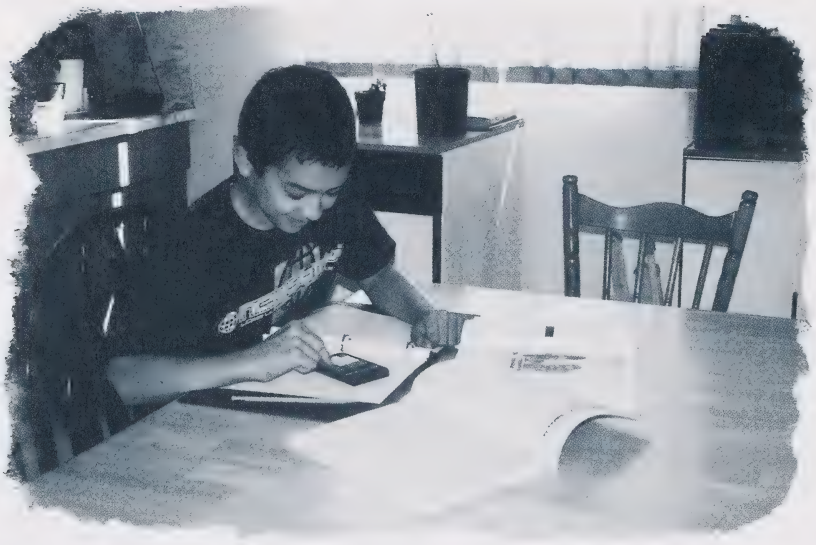
How many teams of 9 could you make if 153 children signed up for softball? If you had 264 softballs, and you put the same number in each of 6 bags, would you have any leftover softballs?

Whenever you need to have equal shares, you can find the answer by dividing.

In this lesson you will learn strategies for estimating and calculating answers to division problems. You will also see how you can use the relationship between multiplication and division to check your work.

# Activity 1

Today you will connect multiplication and division.



Use your calculator. Press the keys shown in the top row of the following table. Each time you press a key, check to see if the display matches the number shown below it.

| **Keystrokes** | ON/C | 8 | × | 7 | = | ÷ | 7 | = | × | 7 | = | ÷ | 7 | = |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Display** | 0 | 8 | 8 | 7 | 56 | 56 | 7 | 8 | 8 | 7 | 56 | 56 | 7 | 8 |

Notice that division "undoes" what multiplication "does," and multiplication "undoes" what division "does." For this reason, multiplication and division can be thought of as opposite or **inverse operations**.

Previously you used arrays to model multiplication. In this activity you will use arrays to model division. You will need the small cubes from your set of base ten blocks.

1. Turn to page 75 of your textbook and answer questions 1 to 4.
   **Note:** The sketches of your arrays do not need to be to scale.

2. Turn to page 76 of your textbook and do question 1 of On Your Own.

3. Turn to page 36 of your Practice and Homework Book and answer questions 1 to 9.

Check your answers on pages 98 to 100 in the Appendix.

## Sharing Time

Now it's time to show your home instructor what you have been learning.

Complete page 37 in your Practice and Homework Book.

Your home instructor will help you check your answers.

# Activity 2

Today you will model division another way and you will connect this model of division and the paper-and-pencil method of dividing.

One of the problems encountered on long voyages was a shortage of fruits and vegetables. Sailors often suffered from scurvy, an illness that results from not getting enough vitamin C.

Citrus fruits (oranges, grapefruit, lemons, and limes) are great sources of vitamin C, as are many green vegetables (especially broccoli, spinach, green peppers, cabbage, lettuce, and peas).

Turn to page 70 in your textbook. The pictures in Equal Shares show how 7 sailors shared 24 peas.

1. Describe the sharing process as it is shown in the pictures.

2. Represent the 24 peas using the least number of base ten blocks. Draw pictures of your blocks.

3. Beginning with the blocks in question 2, draw pictures of each step you would take to solve the problem.

4. Explain how the parts in the following calculation relate to the problem of sharing 24 peas among 7 sailors.

$$\begin{array}{r} 3 \\ 7\overline{)24} \\ 21 \\ \hline 3 \end{array}$$

Check your answers on pages 100 and 101 in the Appendix.

You can use the same process with larger numbers. Work through the following example.

## Example

A supply of 537 turnips has to last for 3 months at sea. How many turnips should the ship's cook plan to use each month?

To estimate the number of turnips used each month, use **compatible numbers**.

> Compatible numbers are numbers that are close to the given numbers but are easier to divide mentally.

$$537 \div 3 \doteq 600 \div 3$$
$$\doteq 200$$

The ship's cook should plan to use about 200 turnips each month.

You can represent the number of turnips, 537, with base ten blocks.

To find the number of turnips the cook should plan to use per month, arrange the base ten blocks into three sets. This will take several steps.

Notice how the steps in the modelling and the steps in the two paper-and-pencil strategies for dividing compare.

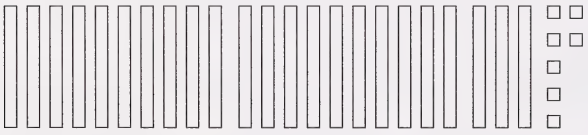
## Model

**Step 1:** Begin with the 5 hundreds flats (500 turnips).

You can put aside 1 hundreds flat (100 turnips) for each of the 3 months. That uses 3 hundreds flats (300 turnips).

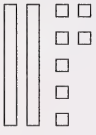
You have 2 hundreds flats (200 turnips), 3 tens rods (30 turnips), and 7 ones cubes (7 turnips) left over.

**Step 2:** Trade the 2 hundreds flats for 20 tens rods. Then, you have 23 tens rods and 7 ones cubes to divide.



Work with the rods. You can put aside 7 tens rods (70 turnips) for each of the 3 months. That uses 21 tens rods (210 turnips).

You have 2 tens rods (20 turnips) and 7 ones cubes (7 turnips) left over.



## Paper-and-Pencil Methods

$$\begin{array}{r} 100 \\ 3\overline{)537} \\ 300 \\ \hline 237 \end{array} \quad \text{or} \quad \begin{array}{r} 1 \\ 3\overline{)537} \\ 3 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 70 \\ 100 \\ 3\overline{)537} \\ 300 \\ \hline 237 \\ 210 \\ \hline 27 \end{array} \quad \text{or} \quad \begin{array}{r} 17 \\ 3\overline{)537} \\ 3\downarrow \\ \hline 23 \\ 21 \\ \hline 2 \end{array}$$

**Step 3:** Trade the 2 tens rods for 20 ones cubes. Then, you have 27 ones cubes to divide.

Put 9 ones cubes (9 turnips) aside for each of the 3 months. That uses all 27 ones cubes. There are none left over.

```
  9                      179
 70                     3)537
100          or          3
3)537                    23
300                      21
237                      27
210                      27
 27                       0
 27
  0
```

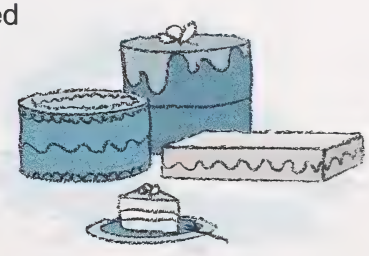
**Step 4:** You have put aside three sets of 1 hundreds flat (100 turnips), 7 tens rods (70 turnips), and 9 ones cubes (9 turnips). In other words, you have put aside three sets of 179 turnips.

The ship's cook should plan to use 179 turnips each month.

```
  9
 70  > 179
100                    179
3)537        or        3)537
300                      3
237                      23
210                      21
 27                      27
 27                      27
  0                       0
```

Which paper-and-pencil strategy did you find easier to understand?

**5.** From January to June, Burni the baker baked 756 cakes. If he baked the same number of cakes each month, how many cakes did Burni bake each month?



**a.** Estimate the number and explain your strategy.

**b.** Model the exact number of cakes with base ten blocks. Then model the division steps.

c. Use a paper-and-pencil method of your choice to calculate the exact number of cakes baked each month.

6. Turn to page 79 in your textbook and answer questions 7 to 12 of Practise Your Skills. Use a paper-and-pencil strategy of your choice.

Check your answers on pages 101 to 104 in the Appendix.

Because multiplication and division are opposite operations, you can use this relationship to check your answers. Work through the following example. You will need your calculator for the check.

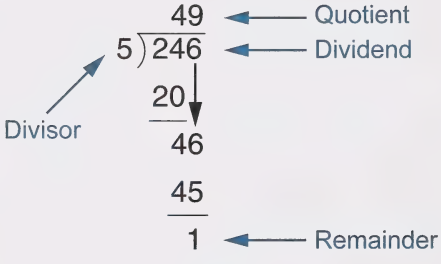
## Example

Estimate $246 \div 5$, find the quotient, and then check your work.

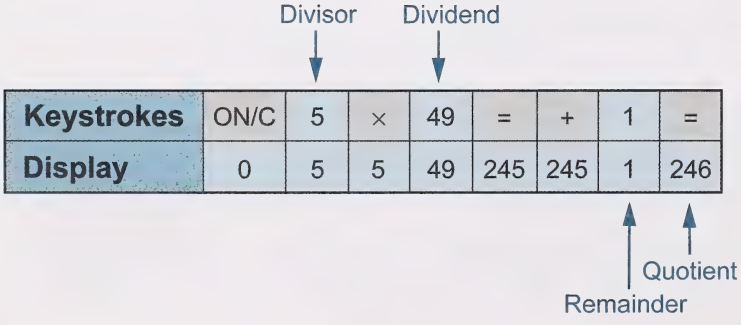
**Estimate**

$$246 \div 5 \doteq 250 \div 5$$
$$\doteq 50$$

**Work**




**Calculator Check**



7. Turn to page 38 of your Practice and Homework Book and answer questions 4, 5, and 6. Use any strategy you wish. Check your answers by multiplying.

Check your answers on page 105 in the Appendix.

## Sharing Time

Now it's time to show your home instructor what you have been learning.

Turn to page 39 of your Practice and Homework Book. Do questions 4 and 5. Then, ask your home instructor to do question 6. Explain your methods to each other.

# Activity 3

Today you will use estimation and your calculator to divide.

On some Saturdays, Marion helps her aunt at her bottle depot. A carton holds 6 pop bottles. There are 527 pop bottles to be put in cartons.

- How many full cartons will there be?
- How many cartons are needed to put all the pop bottles in cartons?
- How many pop bottles will be in the last carton?

To estimate the number of cartons needed, use compatible numbers.

$$527 \div 6 \doteq 540 \div 6$$
$$\doteq 90$$

You know that $54 \div 6 = 9$, so $540 \div 6 = 90$.

About 90 cartons will be needed.

If you use your calculator to get the exact answer, the display will read 87.833333. Since the number is greater than 87 but less than 88, you can answer the first two questions:

- The number of full cartons is 87.
- The number of cartons needed to put all the pop bottles in cartons is 88.

However, you cannot answer the third question just by looking at the display. It does not tell you the remainder.

To find the remainder, think about the 87 full cartons. If each of them holds 6 bottles, then use your calculator to multiply: $6 \times 87 = 522$. Since there were 527 bottles to begin with, subtract the 522 that are in full cartons: $527 - 522 = 5$. There are 5 bottles in the last carton. You have answered the third question.

Do the following questions.

**1.** At the community soccer party, the organizers wanted to serve each of the 356 players one piece of pizza. If each whole pizza was divided into 8 pieces, how many pizzas did the organizers need to order?

**a.** Estimate how many pizzas were needed. Show your method.

**b.** Use your calculator to get the exact answer. Write the number displayed.

**c.** Does the display tell you how many full pizzas were needed? Explain.

**d.** Explain how you can find the number of pieces of pizza that would be left over.

2. Five children earned $289 cutting grass. How can they share the money equally?

   a. Estimate how much money each child will receive. Show your method.

   b. Use your calculator to find the exact answer. Write the number displayed.

   c. Does the display tell you how much money each child will receive? Explain.

   d. Will there be money left over? Explain.

3. Barney and his 6 friends were given 481 sports cards to share equally.

   a. Estimate how many cards each of the 7 people will get. Show your method.

   b. Use your calculator to get the exact answer. Write the number displayed.

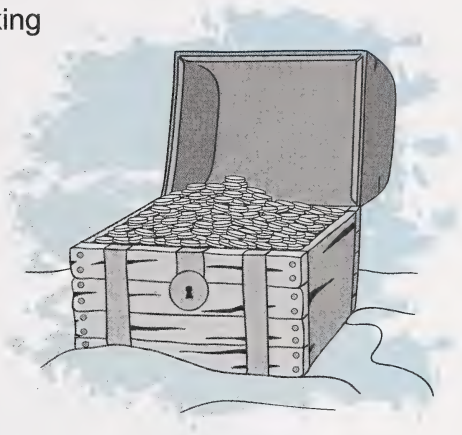
   c. Does the display tell you how many cards each person will receive? Explain.

   d. Explain how you can find how many cards would be left over.

Check your answers on pages 105 and 106 in the Appendix.

# Challenge Activity

Captain Quinn rewarded his 6 hard-working officers by giving them a chest of doubloons to share equally among themselves. Captain Quinn knew the chest held less than 1000 doubloons, and he knew that each officer would receive at least 160 coins.



1. After the doubloons were shared, 2 doubloons were left over. What is the least number of coins that may have been in the chest? Explain your reasoning.

2. What is the greatest number of coins that may have been in the chest? Explain the strategy you used to answer this question.

Check your answers on page 107 in the Appendix.

# Conclusion

In this lesson you used a variety of strategies for estimating and calculating the answer to division problems. Consider the following problem:

Sandy put 147 apples in bags of 8. Angela put 89 apples in bags of 6. Who filled more bags? Who had more apples left over?

Turn to Assignment Booklet 1B and complete the Lesson 4 Assignment.

Keep Assignment Booklet 1B until you have completed the entire booklet.

# Module Summary

In this module you worked with whole numbers. You reviewed and extended your understanding of whole number ideas by estimating, reading, writing, rounding, comparing, and ordering large numbers. You used base ten blocks and diagrams to represent the operations of multiplication and division, and you calculated products and quotients using paper-and-pencil methods.

In addition, you looked through newspapers and magazines for your Numbers in the News project and became more aware of how numbers are used in daily life.

Turn to Assignment Booklet 1B and complete the Numbers in the News project.

When you are done, send Assignment Booklet 1B to your distance learning teacher to be marked.

# Keystrokes

Take out your calculator and complete the following exercises. They will help you review some of the ideas you have learned in Module 1.

## Funky Feature: Place Value

1. Turn to page 50 of the textbook and play the calculator place-value game with two or three friends or family members.

## Funky Feature: Expanded Numerals

This exercise gives you practice writing numbers in expanded form.

### Example

To expand 763 458, enter the following sequence:

If you expanded it correctly, the calculator display will read 763 458.

2. Try expanding these numbers.

   **a.** 9999
   **b.** 604 881
   **c.** 70 028

Now, try some of your own!

Check your answers on page 107 in the Appendix.

## Funky Feature: Order in the Ranks

This exercise gives you practice comparing and ordering numbers.

### Example

Pick the greatest number in each group. Use a calculator to add the numbers you picked.

| | | | | | | |
|---|---|---|---|---|---|---|
| 897 | | 245 | | 2594 | | |
| 978 | + | 524 | + | 2954 | | Sum = 4465 |
| 987 | | 452 | | 2549 | | |

**3.** Try the following questions.

**a.**

| | | | | | |
|---|---|---|---|---|---|
| 34 460 | | 56 676 | | 20 505 | |
| 44 604 | + | 56 767 | + | 22 005 | Sum = ? |
| 36 064 | | 65 657 | | 20 050 | |
| 46 430 | | 67 565 | | 22 050 | |

**b.**

| | | | | | |
|---|---|---|---|---|---|
| 66 570 | | 12 324 | | 132 749 | |
| 65 750 | + | 12 243 | + | 123 749 | Sum = ? |
| 66 750 | | 13 002 | | 123 479 | |
| 67 560 | | 13 431 | | 132 974 | |

**c.**

| | | | | | |
|---|---|---|---|---|---|
| 102 021 | | 73 030 | | 554 545 | |
| 102 102 | + | 70 303 | + | 554 455 | Sum = ? |
| 102 120 | | 73 033 | | 554 554 | |
| 102 012 | | 70 330 | | 554 545 | |

Check your answers on page 107 in the Appendix.

## Funky Feature: You Said It!

This exercise will give you practice reading and writing numbers.

When you turn your calculator display upside down, the numbers resemble letters.

**4.** Enter each key sequence and then turn your calculator upside down to find the sum word to fill in the blank.

**a.** three hundred thousand +
one thousand three +
one hundred thousand +
three hundred ten =

Chorus from "Old MacDonald Had a Farm": _____

**b.** twenty thousand fourteen +
twelve thousand nine hundred twenty-three +
five thousand one hundred forty-two =

Earth is a _____.

**c.** one hundred fourteen thousand five hundred two +
one hundred fifty-nine thousand thirty-six +
one hundred six thousand three hundred eighty-one =

Riddles make the children _____.

Check your answers on page 107 in the Appendix.

# Review

This review will help you apply what you learned in Module 1 and prepare for the final test. Discuss with your home instructor when you should begin the Review and how much of the Review you should complete.

1. Turn to page 92 of your textbook. Do question 4.a. to 4.d. of Skill Bank from This Unit.

2. If you need some help, look back at Lesson 3, where you learned about multiplication. If you are having difficulty, or if you feel you need more practice, complete questions 4.e. to 4.l. in Skill Bank from This Unit.

Check your answers on pages 108 to 110 in the Appendix.

3. Do questions 5.a. to 5.d. in Skill Bank from This Unit.

4. If you need some help, look back at Lesson 4, where you learned about division. If you are having difficulty, or if you feel you need more practice, complete questions 5.e. to 5.l. in Skill Bank from This Unit.

Check your answers on pages 110 to 112 in the Appendix.

5. Turn to page 93 of your textbook. Do questions 4.b., d., and f. from Skill Bank Looking Back.

6. If you need some help, look back at Lesson 1, where you learned about writing numbers in words. If you are having difficulty, or if you feel you need more practice, complete questions 4.a., c., and e. of Skill Bank Looking Back.

Check your answers on page 113 in the Appendix.

**7.** Do question 5 of Skill Bank Looking Back.

**8.** Do question 6 of Skill Bank Looking Back.

If you need some help, look back at Lesson 2, where you learned about ordering numbers. If you are having difficulty, or if you feel you need more practice, do the following questions.

**9.** Order the following numbers from least to greatest.

**a.** 52 576, 725, 525 256, 527, 50 765
**b.** 10 101, 1100, 11 010, 1101, 10 001

Check your answers on page 113 in the Appendix.

Turn to pages 89 to 91 in your textbook. You may use your calculator, but make sure you show what you did to solve each problem.

**10.** Do question 4, 5, or 6 of Problem Bank on page 89.

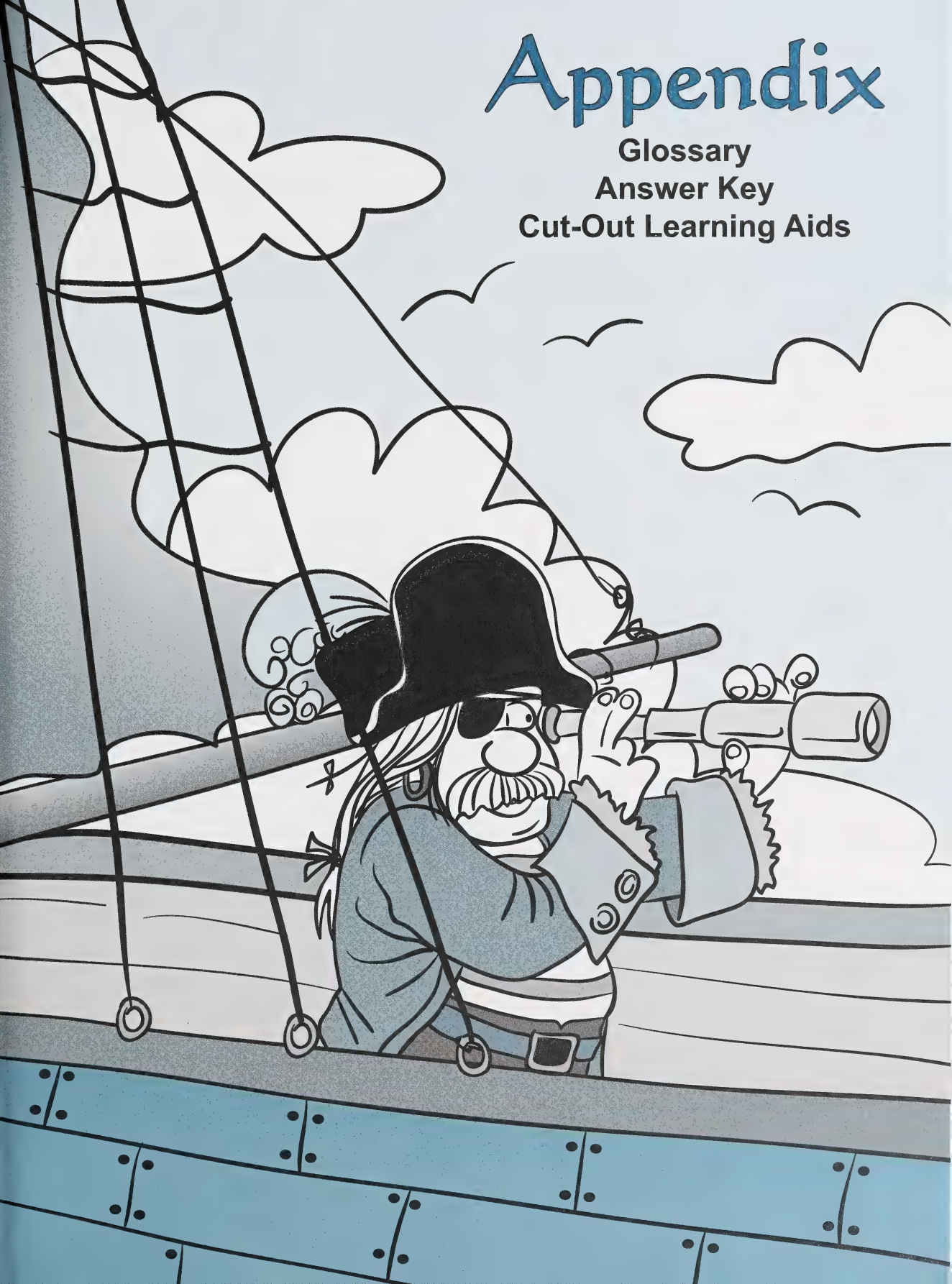
**11.** Do Problem Bank question 7.a. on page 90 of your textbook.

**12.** Do Problem Bank question 8 or 9 on page 91 of your textbook.

**13.** Do Problem Bank question 10 or 11 on page 91 of your textbook.

**14.** Do Problem Bank question 12, 13, or 14 on page 91 of your textbook.

Check your answers on pages 113 to 116 in the Appendix.



# Appendix

**Glossary**
**Answer Key**
**Cut-Out Learning Aids**

# Glossary

**abacus:** a counting device made up of a frame holding rods that are strung with movable beads

**base ten blocks:** a set of blocks (large cubes, flats, rods, and small cubes) used to represent numbers

**base ten numeral system:** a system for representing numbers using the ten digits 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0

**compatible numbers:** an estimation strategy in which you choose numbers that are close to the numbers but easier to compute mentally

**digit:** one of the symbols used to indicate a number in the base ten numeral system

**expanded form:** a number written so that the place value of each digit is shown

**front-end digits:** an estimation strategy in which you use the first digits of the given numbers

**inverse operations:** operations (such as multiplication and division) that undo each other

**number:** the concept of how many, how long, or how much

**numeral:** the symbol(s) used to indicate a number

**Roman numeral system:** a system for representing numbers using the seven letters I, V, X, L, C, D, and M

**rounding:** an estimation strategy in which you use rounded numbers

**standard form:** the usual form of a number

**triad:** each set of three digits in a number

# Answer Key

## Lesson 1: Number Sense

### Activity 1

**1. Textbook, page 46, Visualizing Numbers, questions 1 to 3**

1.

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Blocks Given** | 3 | 9 | 13 | 18 |
| **Regrouped Blocks** | 4 | 0 | 4 | 8 |
| **Number of doubloons represented:** 4048 | | | | |
| **Number written in words:** four thousand forty-eight | | | | |

2.

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Blocks Given** | 2 | 13 | 5 | 0 |
| **Regrouped Blocks** | 3 | 3 | 5 | 0 |
| **Number of doubloons represented:** 3350 | | | | |
| **Number written in words:** three thousand three hundred fifty | | | | |

3.

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Blocks Given** | 5 | 0 | 7 | 17 |
| **Regrouped Blocks** | 5 | 0 | 8 | 7 |
| **Number of doubloons represented:** 5087 | | | | |
| **Number written in words:** five thousand eighty-seven | | | | |

2. **a.** You did not have to regroup any of the thousands cubes because there were less than ten of them in each picture.

   **b.** You would need to regroup when you have ten or more thousands cubes.

3. **a.** The least number of base ten blocks is 17 (5 thousands cubes, 8 hundreds flats, and 4 tens rods). None of the base ten blocks used need to be regrouped.

   **b.** The greatest number of base ten blocks is 5840 (5840 ones cubes). The ones cubes are the smallest base ten blocks and they can be regrouped.

4. **Practice and Homework Book, page 18, Representing Numbers to 10 000, questions 1 to 3**

   1. Estimate: 6000
      Exact Number: 5698
      five thousand six hundred ninety-eight

   2. Estimate: 5000
      Exact Number: 4857
      four thousand eight hundred fifty-seven

   3. Estimate: 9000
      Exact Number: 8582
      eight thousand five hundred eighty-two

## Activity 2

1. **a.** A model for one hundred thousand would be a flat made by joining ten "super rods."

   **b.** The model for one hundred thousand might be called a "super flat."

2. **a.**

| | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| **Base Ten Blocks Needed** | 289 | 4 | 3 | 2 |

**b.**

| | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| **Base Ten Blocks Needed** | 28 | 9 | 4 | 3 | 2 |

**c.**

| | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|---|
| **Base Ten Blocks Needed** | 2 | 8 | 9 | 4 | 3 | 2 |

**3. a.**

| | Thousands | | | Ones | | |
|---|---|---|---|---|---|---|
| | **Hundred Thousands** | **Ten Thousands** | **Thousands** | **Hundreds** | **Tens** | **Ones** |
| **Base Ten Blocks Given** | 4 | 12 | 16 | 14 | 8 | 11 |
| **Regrouped Blocks** | 5 | 3 | 7 | 4 | 9 | 1 |
| **Number of doubloons represented:** 537 491 | | | | | | |
| **Number written in words:** five hundred thirty-seven thousand four hundred ninety-one | | | | | | |
| **Number written in expanded form:** 500 000 + 30 000 + 7000 + 400 + 90 + 1 | | | | | | |

**b.**

| | Thousands | | | Ones | | |
|---|---|---|---|---|---|---|
| | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
| Base Ten Blocks Given | 7 | 18 | 18 | 18 | 19 | 12 |
| Regrouped Blocks | 9 | 0 | 0 | 0 | 0 | 2 |
| **Number of doubloons represented:** 900 002 | | | | | | |
| **Number written in words:** nine hundred thousand two | | | | | | |
| **Number written in expanded form:** 900 000 + 2 | | | | | | |

**c.**

| | Thousands | | | Ones | | |
|---|---|---|---|---|---|---|
| | Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
| Base Ten Blocks Given | 3 | 12 | 8 | 24 | 17 | 31 |
| Regrouped Blocks | 4 | 3 | 0 | 6 | 0 | 1 |
| **Number of doubloons represented:** 430 601 | | | | | | |
| **Number written in words:** four hundred thirty thousand six hundred one | | | | | | |
| **Number written in expanded form:** 400 000 + 30 000 + 600 + 1 | | | | | | |

## 4. Practice and Homework Book, page 20, Representing Numbers to 999 9999, questions 6 to 11

**6.** nine hundred eighty-five thousand two hundred sixty-seven
**7.** five hundred four thousand three hundred seventy-two
**8.** eight hundred eighteen thousand five hundred four
**9.** 762 417
**10.** 48 036
**11.** 903 642

## Activity 3

**1. a.**

| Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| | | | | | |
| **Number written in expanded form:** 400 000 + 70 000 + 2000 + 100 + 70 + 3 | | | | | |
| **Number written in words: four hundred seventy-two thousand one hundred seventy-three** | | | | | |

**b.**

| Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| | | | | | |
| **Number written in expanded form:** 300 000 + 6000 + 500 + 20 + 7 | | | | | |
| **Number written in words:** three hundred six thousand five hundred twenty-seven | | | | | |

**c.**

| Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| | | | | | |
| **Number written in expanded form:** 900 000 + 60 000 + 3000 + 20 + 8 | | | | | |
| **Number written in words:** nine hundred sixty-three thousand twenty-eight | | | | | |

2. **a.** It is the same because you use the same number of counters as base ten blocks for each place value.

   **b.** It is different because the counters for all the place values are the same size and shape. When using base ten blocks, the blocks are different sizes for different place values.

3. **Practice and Homework Book, page 22, Using Place Value, questions 1 to 12**

| | |
|---|---|
| **1.** 9000 | **2.** 60 000 |
| **3.** 90 000 | **4.** 4000 |
| **5.** 500 | **6.** 30 000 |
| **7.** 20 | **8.** 80 |
| **9.** 2 | **10.** 200 |
| **11.** 600 000 | **12.** 40 |

4. **Textbook, page 49, On Your Own, question 1**

   The number must be greater than 12 000 and less than 13 000, so the ten thousands digit must be 1 and the thousands digit must be 2. The hundred, tens, and ones digits must be odd, so they may be 1, 3, 5, 7, or 9.

| Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| 1 | 2 | 1, 3, 5, 7, 9 | 1, 3, 5, 7, 9 | 1, 3, 5, 7, 9 |

   The sum of all the digits is 12. Since the sum of the ten thousands and thousands digits is 3, the sum of the remaining digits must be 9. This means that none of the digits can be 9.

   Look for all sums of 9 made with three of the remaining digits (1, 3, 5, and 7).

   - If one digit is 7, then the other two must be 1 and 1.
   - If one digit is 5, then the other two must be 1 and 3.
   - If one digit is 3, then the other two must be 1 and 5, or 3 and 3.
   - If one digit is 1, then the other two must be 3 and 5, or 1 and 7.

Since the order of the hundreds, tens, and ones digits doesn't matter, you could have any of the following answers.

| Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|
| 1 | 2 | 7 | 1 | 1 |
| 1 | 2 | 1 | 7 | 1 |
| 1 | 2 | 1 | 1 | 7 |
| 1 | 2 | 5 | 1 | 3 |
| 1 | 2 | 5 | 3 | 1 |
| 1 | 2 | 1 | 5 | 3 |
| 1 | 2 | 3 | 5 | 1 |
| 1 | 2 | 1 | 3 | 5 |
| 1 | 2 | 3 | 1 | 5 |
| 1 | 2 | 3 | 3 | 3 |

## Activity 4

**1. a.** No, Shamim's estimate of 1000 grains of rice in a 1-L carton is very low. Grains of rice are so tiny that you could probably hold 1000 grains in your hand.

**b.** To estimate how many grains of rice would fill a 1-L container, you could count the number of grains of rice in a level 5-mL measuring spoon. To make the rice easier to count, put the grains into piles of 10. The 5-mL spoon holds about 240 grains of rice. Therefore, 10 mL holds about 480 grains, 100 mL holds about 4800 grains, and 1000 mL (1 L) holds about 48 000 grains of rice.

**2.** Answers will vary, depending on the size of your telephone book. To estimate, you might use the following strategy (as done with the Edmonton white pages phone book):

- Count the number of columns on one page (4 columns).
- Count the number of names in one column (100 names).

- Find the number of names on one page by multiplying the number of names in one column by the number of columns on each page ($4 \times 100 = 400$ names).
- Find how many pages there are (1100 pages).
- Find how many names there are in the phone book by multiplying the number of names on one page by the number of pages ($400 \times 1100 = 440\,000$ names).

## Challenge Activity

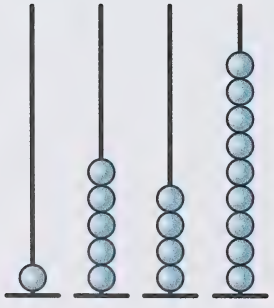
**1.** XXI (21) XXIII (22) XXIII (23) XXIV (24) XXV (25)
XXVI (26) XXVII (27) XXVIII (28) XXIX (29) XXX (30)
XXXI (31) XXXII (32) XXXIII (33) XXXIV (34) XXXV (35)
XXXVI (36) XXXVII (37) XXXVIII (38) XXXIX (39) XL (40)
XLI (41) XLII (42) XLIII (43) XLIV (44) XLV (45)
XLVI (46) XLVII (47) XLVIII (48) XLIX (49) L (50)

**2. a.** LX (60) LXX (70) LXXX (80) XC (90)

**b.** C (100) CC (200) CCC (300)
CD (400) D (500) DC (600)
DCC (700) DCCC (800) CM (900)

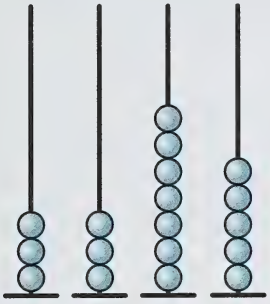
**c.** M (1000) MM (2000) MMM (3000)

**3. a.** MDXLIX



$= M + D + XL + IX$
$= 1000 + 500 + 40 + 9$
$= 1549$

**b.** MMMCCCLXXV

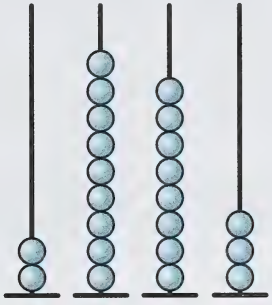


$= MMM + CCC + LXX + V$

$= 3000 + 300 + 70 + 5$

$= 3375$

**c.** MMCMLXXXIII



$= MM + CM + LXXX + III$

$= 2000 + 900 + 80 + 3$

$= 2983$

**4.** Following are some ways Roman numerals are different from base ten numerals:

- Roman numerals have no symbol for zero.
- To find the value of a Roman numeral, you may have to add or subtract. For example, VI means $5 + 1 = 6$, while IV means $5 - 1 = 4$.
- Long Roman numerals can represent small numbers and short Roman numerals can represent large numbers. For example, XXXVIII = 38 and M = 1000.

## Lesson 2: Comparing and Ordering

### Activity 1

**1. a.**

| Thousands | Hundreds | Tens | Ones |
|---|---|---|---|
| ●●●●● | ●●●● | ●●●● | ●●● |

The cook received 5443 doubloons.

b.

| Thousands | Hundreds | Tens | Ones |
|---|---|---|---|
| ●● | ●●●● | ●●●● | ●●● |

The quartermaster received 2443 doubloons.

c.

| Thousands | Hundreds | Tens | Ones |
|---|---|---|---|
| ●●●●● ● | ● | ●●●● | ●●● |

The first mate received 6143 doubloons.

d.

| Thousands | Hundreds | Tens | Ones |
|---|---|---|---|
| ●●●●● | ●●●● | | ●●● |

The second mate received 5403 doubloons.

e.

| Thousands | Hundreds | Tens | Ones |
|---|---|---|---|
| ●●●●● | ●●●● | ●●●●● | ● |

The navigator received 5451 doubloons.

2. **a.** The first mate received the greatest number of doubloons.
   **b.** The quartermaster received the least number of doubloons.
   **c.** From least to greatest the shares are 2443, 5403, 5443, 5451, and 6143.

3. **Practice and Homework Book, page 22, questions 13 to 24**

**13.** 650 246
**14.** 302 185
**15.** 647 205
**16.** 35 081
**17.** 37 915
**18.** 764 270
**19.** 706 383
**20.** 989 888
**21.** 645 671
**22.** 328 794
**23.** 701 486
**24.** 26 488

## Activity 2

**1. Textbook, pages 43 to 45, Starting Out, questions 1 and 2**

1.

| | |
|---|---|
| Most Expensive | $17 850 |
| Least Expensive | $2595 |
| Between $5000 and $10 000 | $6450, $8225, $9995 |
| Differ by $500 or Less | $3000 and $2595 |
| Over $10 000 | $10 500, $14 600, $17 850 |

2.

| | |
|---|---|
| Base Ten Blocks | 3252 |
| Cheque | $18 208 |
| Boxes of Elastics | 5004 |
| Place-Value Chart | 90 826 |
| Money | $2127 |
| Jars of Pennies | 2308¢ |
| Calculator | 8280 |

The greatest number is 90 826.

The least number is 2127.

It is important to know how to read numbers to be able to compare them and put them in order.

**2. Textbook, pages 56 and 57, Problem Bank, questions 1, 2.a., 2.b., and 6**

1. 2560, 2506, 2650, 2605, 2056, 2065,
5260, 5206, 5602, 5620, 5026, 5062,
6520, 6502, 6250, 6205, 6025, 6052

**Note:** Whole numbers do not begin with the digit zero.

2. **a.** Least: 235 689
   Greatest: 986 532
   Number that falls between: Answers will vary. One possible answer is 568 923.

   **b.** Least: 40 459
   Greatest: 95 440
   Number that falls between: Answers will vary. One possible answer is 44 590.

   **Note:** Whole numbers do not begin with the digit zero.

6. From least to greatest the scores are 14 131, 26 945, 38 042, 85 327, and 90 000.

## Activity 3

1. **a.** 941 000 > 756 000
   Nova Scotia had the greater population in 2000.

   **b.** 137 600 > 136 900
   Prince Edward Island had more population in 1999 than in 1998.

   **c.** 540 800 < 554 100
   Newfoundland had less population in 1999 than in 1997.

2. **a.** Newfoundland: 500 000
   Prince Edward Island: 100 000
   Nova Scotia: 900 000
   New Brunswick: 800 000

   **b.** The provinces in order from least population in 2000 to greatest population in 2000 are Prince Edward Island, Newfoundland, New Brunswick, and Nova Scotia.

**3. Practice and Homework Book, page 20, Representing Numbers to 999 999, questions 1 to 5**

| | Least Number | Greatest Number | Number in Between |
|---|---|---|---|
| 1. | 245 678 (Notice that the digits are arranged from least to greatest.) | 876 542 (Notice that the digits are arranged from greatest to least.) | One possible answer is 456 872. |
| 2. | 134 577 | 775 431 | One possible answer is 517 473. |
| 3. | 123 689 | 986 321 | One possible answer is 132 689. |
| 4. | 123 457 | 754 321 | One possible answer is 271 435. |
| 5. | 104 678 | 876 410 | One possible answer is 461 078. |

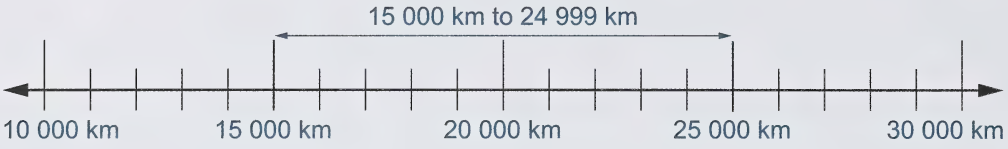
## Challenge Activity

1.

| Name | Total Kilometres Travelled | Highest Colour of Stars Displayed | Number of Highest Colour Stars |
|---|---|---|---|
| **Slimy** | 6734 | blue | 7 |
| **Buckle** | 23 587 | red | 2 |
| **Sharky** | 825 342 | gold | 8 |
| **Black Beard** | 85 710 | red | 9 |
| **Rusty** | 260 196 | gold | 3 |
| **Bob** | 7142 | blue | 7 |
| **Peg Leg** | 366 145 | gold | 4 |
| **Iron Man** | 9501 | red | 1 |

2. No, you could not tell exactly how far he sailed. If a sailor displayed 2 red stars, he would have travelled at least 15 000 km. To display 3 red stars, he would have to travel at least 25 000 km, so the greatest distance he may have travelled to display 2 red stars is 24 999 km.

   Look at the number line that follows to see the range of distances a sailor could have travelled in order to display 2 red stars.




3. **a.** The least possible kilometres travelled is 250 000 km.
   The greatest possible 349 999 km.

   **b.** The least possible kilometres travelled is 8500 km.
   The greatest possible kilometres travelled is 9499 km.

   **c.** The least possible kilometres travelled is 45 000 km.
   The greatest possible kilometres travelled is 54 999 kilometres.

## Lesson 3: Multiplication

### Activity 1

1. **a.**

| **Rounding** | **Front-end digits** | **Compensating** |
|---|---|---|
| $26 \times 34 \doteq 30 \times 30$ | $26 \times 34 \doteq 20 \times 300$ | $26 \times 34 \doteq 20 \times 40$ |
| $\doteq 900$ cookies | $\doteq 600$ | $\doteq 800$ |

   **b.** $26 \times 34 = 884$ cookies

2. **a.**

| **Rounding** | **Front-end digits** | **Compensating** |
|---|---|---|
| $24 \times 366 \doteq 20 \times 400$ | $24 \times 366 \doteq 20 \times 300$ | $24 \times 360 \doteq 20 \times 400$ |
| $\doteq 8000$ hours | $\doteq 6000$ | $\doteq 8000$ |

   **b.** $24 \times 366 = 8784$ hours

**3. a.** Answers will vary. A sample answer is given.

You are going to the store to buy 35 valentine cards. They cost 98¢ each and you want to make sure you take enough cash with you.

**b.** You bought 35 valentine cards. They cost 98¢ each and you are writing a cheque for the total amount.

**c.**

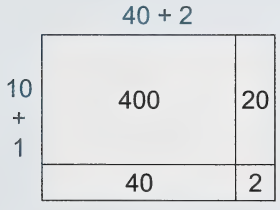
| **Rounding** | **Front-end digits** | **Compensating** |
|---|---|---|
| $35 \times 98 \doteq 40 \times 100$ | $35 \times 98 \doteq 30 \times 90$ | $35 \times 98 \doteq 30 \times 100$ |
| $\doteq 4000¢$ or \$40 | $\doteq 2700¢$ or \$27 | $\doteq 3000¢$ or \$30 |

**d.** $35 \times 98 = 3430¢$

$= \$34.30$

## Activity 2

**1. a.**




$10 \times 40 = 400$

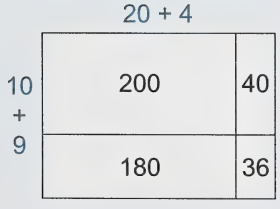
$10 \times 2 = 20$

$1 \times 40 = 40$

$1 \times 2 = 2$

The sum is 462. Therefore, $11 \times 42 = 462$.

**b.**




$10 \times 20 = 200$

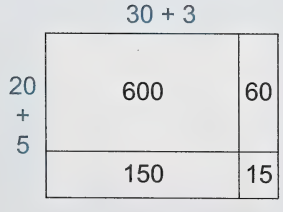
$10 \times 4 = 40$

$9 \times 20 = 180$

$9 \times 4 = 36$

The sum is 456. Therefore, $19 \times 24 = 456$.

**c.**




$20 \times 30 = 600$

$20 \times 3 = 60$

$5 \times 30 = 150$

$5 \times 3 = 15$

The sum is 825. Therefore, $25 \times 33 = 825$.

## 2. Textbook, page 72, On Your Own, questions 1 to 3

**1.** $10 \times 20 = 200$
$10 \times 3 = 30$
$4 \times 20 = 80$
$4 \times 3 = 12$

The sum is 322. Therefore, $14 \times 23 = 322$.

**2. a.** $10 \times 10 = 100$ or $10 \times 13 = 130$
$10 \times 3 = 30$ $2 \times 13 = 26$
$2 \times 10 = 20$
$2 \times 3 = 6$

The sum is 156. Therefore, $12 \times 13 = 156$.

**b.** $10 \times 20 = 200$ or $10 \times 21 = 210$
$10 \times 1 = 10$ $4 \times 21 = 84$
$4 \times 20 = 80$
$4 \times 1 = 4$

The sum is 294. Therefore, $14 \times 21 = 294$.

**3.**

| | 20 + 2 | |
|---|---|---|
| 10 + 3 | 200 | 20 |
| | 60 | 6 |

or

| | 22 |
|---|---|
| 10 + 3 | 220 |
| | 66 |

$10 \times 20 = 200$
$10 \times 2 = 20$
$3 \times 20 = 60$
$3 \times 2 = 6$

$10 \times 22 = 220$
$3 \times 22 = 66$

The sum is 286. Therefore, $13 \times 22 = 286$.

## Activity 3

**1. a. Estimate**

$26 \times 12 \doteq 30 \times 10$

$\doteq 300$

or

$26 \times 12 \doteq 20 \times 10$

$\doteq 200$

**Exact Answer**

$$\begin{array}{r} 26 \\ \times\ 12 \\ \hline 200 \\ 60 \\ 40 \\ 12 \\ \hline 312 \end{array} \begin{array}{l} \\ \\ 10 \times 20 = \\ 10 \times 6 = \\ 2 \times 20 = \\ 2 \times 6 = \\ \\ \end{array}$$

or

$$\begin{array}{r} 26 \\ \times\ 12 \\ \hline 260 \\ 52 \\ \hline 312 \end{array} \begin{array}{l} \\ \\ 10 \times 26 = \\ 2 \times 26 = \\ \\ \end{array}$$

The number of players needed is 312.

**b. Estimate**

$38 \times 63 \doteq 40 \times 60$

$\doteq 2400$

or

$38 \times 63 \doteq 30 \times 60$

$\doteq 1800$

**Exact Answer**

$$\begin{array}{r} 63 \\ \times\ 38 \\ \hline 1800 \\ 90 \\ 480 \\ 24 \\ \hline 2394 \end{array} \begin{array}{l} \\ \\ 30 \times 60 = \\ 30 \times 3 = \\ 8 \times 60 = \\ 8 \times 3 = \\ \\ \end{array}$$

or

$$\begin{array}{r} 63 \\ \times\ 38 \\ \hline 1890 \\ 504 \\ \hline 2394 \end{array} \begin{array}{l} \\ \\ 30 \times 63 = \\ 8 \times 63 = \\ \\ \end{array}$$

The cost is $2394.

**c. Estimate**

$31 \times 76 \doteq 30 \times 80$

$\doteq 2400$

or

$31 \times 76 \doteq 30 \times 70$

$\doteq 2100$

**Exact Answer**

$$\begin{array}{r} 76 \\ \times\ 31 \\ \hline 2100 \\ 180 \\ 70 \\ 6 \\ \hline 2356 \end{array} \begin{array}{l} \\ \\ 30 \times 70 = \\ 30 \times 6 = \\ 1 \times 70 = \\ 1 \times 6 = \\ \\ \end{array}$$

or

$$\begin{array}{r} 76 \\ \times\ 31 \\ \hline 2280 \\ 76 \\ \hline 2356 \end{array} \begin{array}{l} \\ \\ 30 \times 76 = \\ 1 \times 76 = \\ \\ \end{array}$$

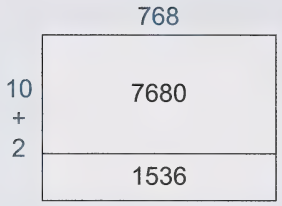
Ruth's family drove 2356 km in January.

**2.**

$$\begin{array}{r} 768 \\ \times\ 12 \\ \hline 7680 \\ 1536 \\ \hline 9216 \end{array}$$

$10 \times 768 =$

$2 \times 768 =$




**3. Practice and Homework Book, page 34, questions 2 to 4**

**2. Estimate:** $25 \times 75 \doteq 30 \times 80 \doteq 2400$ or $25 \times 75 \doteq 20 \times 70 \doteq 1400$

**Exact number:**

$$\begin{array}{rr} & 75 \\ & \times\ 25 \\ \hline 20 \times 70 = & 1400 \\ 20 \times 5 = & 100 \\ 5 \times 70 = & 350 \\ 5 \times 5 = & 25 \\ \hline & 1875 \end{array}$$

or

$$\begin{array}{rr} & 75 \\ & \times\ 25 \\ \hline 20 \times 75 = & 1500 \\ 5 \times 75 = & 375 \\ \hline & 1875 \end{array}$$

At this rate, your heart beats 1875 times.

**3. Estimate:** $6 \times 365 \doteq 6 \times 400 \doteq 2400$ or $6 \times 365 \doteq 6 \times 300 \doteq 1800$

**Exact number:**

$$\begin{array}{rr} & 365 \\ & \times\ 6 \\ \hline 6 \times 300 = & 1800 \\ 6 \times 60 = & 360 \\ 6 \times 5 = & 30 \\ \hline & 2190 \end{array}$$

At this rate, you would walk 2190 km.

**4. Estimate:** $15 \times 45 \doteq 20 \times 50$ or $15 \times 45 \doteq 10 \times 40$

$\doteq 1000$ $\doteq 400$

**Exact number:**

$$\begin{array}{rr} & 45 \\ \times & 15 \\ \hline 10 \times 40 = & 400 \\ 10 \times 5 = & 50 \\ 5 \times 40 = & 200 \\ 5 \times 5 = & 25 \\ \hline & 675 \end{array} \quad \text{or} \quad \begin{array}{rr} & 45 \\ \times & 15 \\ \hline 10 \times 45 = & 450 \\ 5 \times 45 = & 225 \\ \hline & 675 \end{array}$$

At this rate, you could read 675 pages.

**4. Textbook, page 74, Practise Your Skills, question 2**

**a.**
$$\begin{array}{r} 34 \\ \times\ 26 \\ \hline 204 \\ 680 \\ \hline 884 \end{array}$$

**b.**
$$\begin{array}{r} 98 \\ \times\ 33 \\ \hline 294 \\ 2940 \\ \hline 3234 \end{array}$$

**c.**
$$\begin{array}{r} 212 \\ \times\ 45 \\ \hline 1060 \\ 8480 \\ \hline 9540 \end{array}$$

**d.**
$$\begin{array}{r} 327 \\ \times\ 76 \\ \hline 1\,962 \\ 22\,890 \\ \hline 24\,852 \end{array}$$

## Challenge Activity

**1. a.**
$$\begin{array}{r} 81 \\ \times\ 53 \\ \hline 4293 \end{array} \quad \text{or} \quad \begin{array}{r} 53 \\ \times\ 81 \\ \hline 4293 \end{array}$$

**Note:** The solutions use the same pair of factors (81 and 53).

**b.** The greatest digits, 8 and 5, must go in the tens place of the factors. There are two possibilities to check: $83 \times 51 = 4233$ and $81 \times 53 = 4293$.

**2. a.**

$$\begin{array}{r} 1\ 5 \\ \times\ 3\ 8 \\ \hline 5\ 7\ 0 \end{array} \quad \text{or} \quad \begin{array}{r} 3\ 8 \\ \times\ 1\ 5 \\ \hline 5\ 7\ 0 \end{array}$$

**Note:** The solutions use the same pair of factors (15 and 38).

**b.** The least digits, 1 and 3, must go in the tens place of the factors. There are two possibilities to check: $15 \times 38 = 570$ and $18 \times 35 = 630$.

**3. a.** You can make 12 different products.

**b.** Make an organized list.

| | | | |
|---|---|---|---|
| $13 \times 58 = 754$ | $13 \times 85 = 1105$ | $31 \times 58 = 1798$ | $31 \times 85 = 2635$ |
| $15 \times 38 = 570$ | $15 \times 83 = 1245$ | $51 \times 38 = 1938$ | $51 \times 83 = 4233$ |
| $18 \times 35 = 630$ | $18 \times 53 = 954$ | $81 \times 35 = 2835$ | $81 \times 53 = 4293$ |
| $35 \times 18 = 630$ * | $35 \times 81 = 2835$ * | $53 \times 18 = 954$ * | $53 \times 81 = 4293$ * |
| $38 \times 15 = 570$ * | $38 \times 51 = 1938$ * | $83 \times 15 = 1245$ * | $83 \times 51 = 4233$ * |
| $58 \times 13 = 754$ * | $58 \times 31 = 1798$ * | $85 \times 13 = 1105$ * | $85 \times 31 = 2635$ * |

***Note:** The 12 factor pairs in the top three rows are the same as the 12 factor pairs in the bottom three rows.

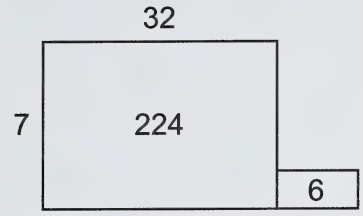
## Lesson 4: Division

### Activity 1

**1. Textbook, page 75, Modelling Division, questions 1 to 4**

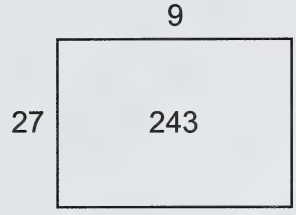
| | Sketch | Division Expression |
|---|---|---|
| **1.** | 9 / 18 \| 162 | $9\overline{)162}^{\,18}$ or $162 \div 9 = 18$ |

**2.**



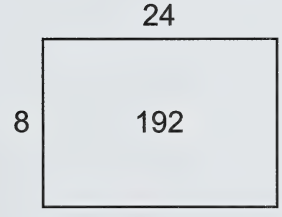

$7\overline{)230}$ $\begin{matrix}32\ \text{R6}\end{matrix}$ or $230 \div 7 = 32\ \text{R6}$

**3.**




$9\overline{)243}$ $\begin{matrix}27\end{matrix}$ or $243 \div 9 = 27$

**4.**




$8\overline{)192}$ $\begin{matrix}24\end{matrix}$ or $192 \div 8 = 24$

**2. Textbook, page 76, On Your Own, question 1**

If you start with 75 cubes, they can be arranged in 5 rows of 15. They can be arranged 12 rows of 6 with 3 left over. They can be arranged in 25 rows of 3.

**3. Practice and Homework Book, page 36, questions 1 to 9**

**1.** $104 \div 13 = 8$ or $13\overline{)104}$ $\begin{matrix}8\end{matrix}$

**2.** $54 \div 9 = 6$ or $9\overline{)54}$ $\begin{matrix}6\end{matrix}$

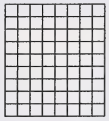
**3.** $90 \div 9 = 10$ or $9\overline{)90}$ $\begin{matrix}10\end{matrix}$

**4.** $88 \div 8 = 11$ or $8\overline{)88}$ $\begin{matrix}11\end{matrix}$

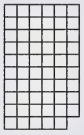
**5.** $109 \div 15 = 7\ \text{R4}$ or $15\overline{)109}$ $\begin{matrix}7\ \text{R4}\end{matrix}$

**6.** $75 \div 7 = 10\ \text{R5}$ or $7\overline{)75}$ $\begin{matrix}10\ \text{R5}\end{matrix}$

**7.** $72 \div 8 = 9$



**8.** $59 \div 6 = 9$ R5



**9.** $66 \div 11 = 6$

## Activity 2

**1.** First, one pea is put on each of the seven knives. Next, a second pea is put on each of the seven knives. Finally, a third pea is put on each of the seven knives. Three peas are left over.

**2.**

**3. Step 1:**

**Step 2:** Trade the 2 rods for 20 ones cubes.

**Step 3:** Put 1 ones cube in each of the 7 sets.

**Step 4:** Put a second ones cube in each of the sets.

**Step 5:** Put a third cube in each of the sets.

Each sailor get 3 peas and there are 3 peas left over.

**4.**

This is the number of peas each person got.

There are the 7 people sharing the peas. → $7\overline{)24}$ ← This is the 24 peas that the sailors started with.

$3$

$21$ ← This is the number of peas that were shared. Seven people got 3 peas each.

$7 \times 3 = 21$

$3$ ← This is the number of peas left over after sharing 21 peas.

$24 \text{ peas} - 21 \text{ peas} = 3 \text{ peas}$

**5. a.** Use compatible numbers to estimate the answers.

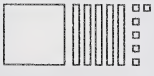
$$756 \div 6 \doteq 600 \div 6$$
$$\doteq 100$$

Burni baked about 100 cakes each month.

**b. Step 1:** Use 7 hundreds flats, 5 tens rods, and 6 ones cubes to represent the 756 cakes.

**Step 2:** Put aside 1 hundreds flat (100 cakes) for each month. That uses 6 hundreds flats. This leaves 1 hundreds flat, 5 tens rods, and 6 ones cubes (156 cakes).

Each month (so far):

Cakes left over: 

**Step 3:** Trade 1 hundreds flat for 10 tens rods. There are now 15 tens rods and 6 ones cubes left.

Cakes left over:

**Step 4:** Put aside 2 tens rods (20 cakes) for each month. That uses 12 tens rods. This leaves 3 tens rods and 6 ones cubes (36 cakes).

Each month (so far):

Cakes left over:

**Step 5:** Trade the 3 tens rods for 30 ones cubes. Now 36 ones cubes are left.

Cakes left over:

**Step 6:** Put aside 6 ones cubes (6 cakes) for each month. That uses 36 ones cubes. No ones cubes (cakes) are left.

Each month:

Burni baked 126 cakes each month.

**c.**

```
   6
  20  > 126
 100
6)756
 600
 156
 120
  36
  36
   0
```

or

```
   126
6)756
 6↓
 15
 12↓
  36
  36
   0
```

## 6. Textbook, page 79, Practise Your Skills, questions 7 to 12

**7.**

```
      1
     10  > 11 R2
4 ) 46
    40
    --
     6
     4
     -
     2
```

or

```
     11 R2
4 ) 46
    4 |
    --
     6
     4
     -
     2
```

**8.**

```
      5
     20  > 25 R2
3 ) 77
    60
    --
    17
    15
    --
     2
```

or

```
     25 R2
3 ) 77
    6 |
    --
    17
    15
    --
     2
```

**9.**

```
      5
     10
    100  > 115 R1
8 ) 921
    800
    ---
    121
     80
    ---
     41
     40
    ---
      1
```

or

```
     115 R1
8 ) 921
    8 |
    --
    12
     8 |
    ---
     41
     40
    ---
      1
```

**10.**

```
        1
       30   > 131 R1
      100
7 ) 918
    700
    218
    210
      8
      7
      1
```

or

```
      131 R1
7 ) 918
    7
    21
    21
     8
     7
     1
```

**11.**

```
        4
       50   > 354
      300
2 ) 708
    600
    108
    100
      8
      8
      0
```

or

```
      354
2 ) 708
    6
    10
    10
    08
     8
     0
```

**12.**

```
        1
       80   > 81 R3
7 ) 570
    560
     10
      7
      3
```

or

```
      81 R3
7 ) 570
    56
    10
     7
     3
```

**7. Practice and Homework Book, page 38, questions 4, 5, and 6**

**4.**

$$\begin{array}{r} 2 \\ 10 \\ 8\overline{)97} \\ 80 \\ \hline 17 \\ 16 \\ \hline 1 \end{array} \quad 12 \text{ R1}$$

or

$$\begin{array}{r} 12 \text{ R1} \\ 8\overline{)97} \\ 8\downarrow \\ \hline 17 \\ 16 \\ \hline 1 \end{array}$$

**Check**

$$\begin{array}{r} 12 \\ \times\ 8 \\ \hline 96 \\ +\ 1 \\ \hline 97 \end{array}$$

**5.**

$$\begin{array}{r} 5 \\ 30 \\ 7\overline{)245} \\ 210 \\ \hline 35 \\ 35 \\ \hline 0 \end{array} \quad 35$$

or

$$\begin{array}{r} 35 \\ 7\overline{)245} \\ 21\downarrow \\ \hline 35 \\ 35 \\ \hline 0 \end{array}$$

**Check**

$$\begin{array}{r} 35 \\ \times\ 7 \\ \hline 245 \end{array}$$

**6.**

$$\begin{array}{r} 1 \\ 80 \\ 9\overline{)736} \\ 720 \\ \hline 16 \\ 9 \\ \hline 7 \end{array} \quad 81 \text{ R7}$$

or

$$\begin{array}{r} 81 \text{ R7} \\ 9\overline{)736} \\ 72\downarrow \\ \hline 16 \\ 9 \\ \hline 7 \end{array}$$

**Check**

$$\begin{array}{r} 81 \\ \times\ 9 \\ \hline 729 \\ +\ 7 \\ \hline 736 \end{array}$$

## Activity 3

**1. a.** $356 \div 8 \doteq 320 \div 8$

$\doteq 40$

About 40 pizzas were needed.

**b.** $356 \div 8 = 44.5$

**c.** Yes, 44.5 is greater than 44 and less than 45. Since you are buying whole pizzas, you would have to buy 45 of them.

**d.** The 45 pizzas are each cut into 8 pieces, so multiply $8 \times 45 = 360$.

You need 356 pieces, so there will be $360 - 356 = 4$ pieces left over.

**2. a.** $289 \div 5 \doteq 300 \div 5$

$\doteq 60$

Each child will receive about $60.

**b.** $289 \div 5 = 57.8$

**c.** Yes. Each child will receive $57.80.

**d.** No. After each child receives $57.00, there will be $4.00 left, but that amount can be shared equally by giving each child an extra 80¢.

**3. a.** $481 \div 7 \doteq 490 \div 7$

$\doteq 70$

The 7 people will get about 70 sports cards each.

**b.** $481 \div 7 = 68.714285$

**c.** Yes. The number on the display is between 68 and 69. Each child will get 68 cards.

**d.** If 7 children each receive 68 cards, that is $7 \times 68 = 476$ cards. There were 481 cards to start with, so there will be $481 - 476 = 5$ cards left over.

## Challenge Activity

Strategies may vary. Sample solutions are given.

1. If each officer received 160 coins, then they would have shared $6 \times 160 = 960$ doubloons. The least number of doubloons that could have been in the chest is 962.

2. To find the greatest possible number of coins, start with 962 and keep adding 6 until you reach the greatest number less than 1000.You may use your calculator.

| **Keystrokes** | ON/C | 962 | + | 6 | = | = | = | = | = | = |
|---|---|---|---|---|---|---|---|---|---|---|
| **Display** | 0 | 962 | 962 | 968 | 968 | 974 | 980 | 986 | 992 | 998 |

Therefore, the greatest possible number of doubloons in the chest is 998.

## Keystrokes

1. **Textbook, page 50, The Calculator Place-Value Game**

2. **a.** $9000 + 900 + 90 + 9 = 9999$
   **b.** $600\,000 + 4000 + 800 + 80 + 1 = 604\,881$
   **c.** $70\,000 + 20 + 8 = 70\,028$

3. **a.** 136 045 $(46\,430 + 67\,565 + 22\,050)$
   **b.** 213 965 $(67\,560 + 13\,431 + 132\,974)$
   **c.** 729 707 $(102\,120 + 73\,033 + 554\,554)$

4. **a.** EIEIOH **b.** GLOBE **c.** GIGGLE

## Review

**1. Textbook, page 92, Skill Bank from This Unit, questions 4.a. to 4.d.**

**4. a. Estimate** **Exact Answer**

$64 \times 62 \doteq 60 \times 60$
$\doteq 3600$

$$\begin{array}{r} 64 \\ \times\ 62 \\ \hline 128 \\ 3840 \\ \hline 3968 \end{array}$$

**b. Estimate** **Exact Answer**

$18 \times 55 \doteq 20 \times 50$
$\doteq 1000$

$$\begin{array}{r} 55 \\ \times\ 18 \\ \hline 440 \\ 550 \\ \hline 990 \end{array}$$

**c. Estimate** **Exact Answer**

$239 \times 43 \doteq 250 \times 40$
$\doteq 10\,000$

$$\begin{array}{r} 239 \\ \times\ 43 \\ \hline 717 \\ 9\,560 \\ \hline 10\,277 \end{array}$$

**d. Estimate** **Exact Answer**

$47 \times 46 \doteq 50 \times 40$
$\doteq 2000$

$$\begin{array}{r} 47 \\ \times\ 46 \\ \hline 282 \\ 1880 \\ \hline 2162 \end{array}$$

**2. Textbook, page 92, Skill Bank from This Unit, questions 4.e. to 4.l.**

**4. e. Estimate** **Exact Answer**

$51 \times 49 \doteq 50 \times 50$
$\doteq 2500$

$$\begin{array}{r} 51 \\ \times\ 49 \\ \hline 459 \\ 2040 \\ \hline 2499 \end{array}$$

**f. Estimate**

$435 \times 78 \doteq 400 \times 100$

$\doteq 40\,000$

**Exact Answer**

$$\begin{array}{r} 435 \\ \times\ 78 \\ \hline 3\,480 \\ 30\,450 \\ \hline 33\,930 \end{array}$$

**g. Estimate**

$20 \times 38 \doteq 20 \times 40$

$\doteq 800$

**Exact Answer**

$$\begin{array}{r} 38 \\ \times\ 20 \\ \hline 760 \end{array}$$

**h. Estimate**

$393 \times 65 \doteq 400 \times 60$

$\doteq 24\,000$

**Exact Answer**

$$\begin{array}{r} 393 \\ \times\ 65 \\ \hline 1\,965 \\ 23\,580 \\ \hline 25\,545 \end{array}$$

**i. Estimate**

$134 \times 5 \doteq 100 \times 5$

$\doteq 500$

**Exact Answer**

$$\begin{array}{r} 134 \\ \times\ 5 \\ \hline 670 \end{array}$$

**j. Estimate**

$3 \times 368 \doteq 3 \times 600$

$\doteq 1800$

**Exact Answer**

$$\begin{array}{r} 638 \\ \times\ 3 \\ \hline 1914 \end{array}$$

**k. Estimate** **Exact Answer**

$927 \times 4 \doteq 900 \times 4$
$\doteq 3600$

$$\begin{array}{r} 927 \\ \times\ 4 \\ \hline 3708 \end{array}$$

**l. Estimate** **Exact Answer**

$8 \times 493 \doteq 8 \times 500$
$\doteq 4000$

$$\begin{array}{r} 493 \\ \times\ 8 \\ \hline 3944 \end{array}$$

**3. Textbook, page 92, Skill Bank from This Unit, questions 5.a. to 5.d.**

**5. a. Estimate** **Exact Answer**

$675 \div 5 \doteq 700 \div 5$
$\doteq 140$

$$\begin{array}{r} 135 \\ 5\overline{)675} \\ \underline{5\phantom{00}} \\ 17 \\ \underline{15\phantom{0}} \\ 25 \\ \underline{25} \\ 0 \end{array}$$

**b. Estimate** **Exact Answer**

$276 \div 3 \doteq 300 \div 3$
$\doteq 100$

$$\begin{array}{r} 92 \\ 3\overline{)276} \\ \underline{27\phantom{0}} \\ 06 \\ \underline{6} \\ 0 \end{array}$$

**c. Estimate**

$288 \div 6 \doteq 300 \div 6$

$\doteq 50$

**Exact Answer**

$$\begin{array}{r} 48 \\ 6\overline{)288} \\ \underline{24}\downarrow \\ 48 \\ \underline{48} \\ 0 \end{array}$$

**d. Estimate**

$315 \div 7 \doteq 350 \div 7$

$\doteq 50$

**Exact Answer**

$$\begin{array}{r} 45 \\ 7\overline{)315} \\ \underline{28}\downarrow \\ 35 \\ \underline{35} \\ 0 \end{array}$$

**4. Textbook, page 92, Skill Bank from This Unit, questions 5.e. to 5.l.**

**5. e. Estimate**

$51 \div 4 \doteq 48 \div 4$

$\doteq 12$

**Exact Answer**

$$\begin{array}{r} 12\ \text{R3} \\ 4\overline{)51} \\ \underline{4}\downarrow \\ 11 \\ \underline{8} \\ 3 \end{array}$$

**f. Estimate**

$78 \div 5 \doteq 80 \div 5$

$\doteq 16$

**Exact Answer**

$$\begin{array}{r} 15\ \text{R3} \\ 5\overline{)78} \\ \underline{5}\downarrow \\ 28 \\ \underline{25} \\ 3 \end{array}$$

**g. Estimate**

$66 \div 8 \doteq 64 \div 8$

$\doteq 8$

**Exact Answer**

$$\begin{array}{r} 8\ \text{R2} \\ 8\overline{)66} \\ \underline{64} \\ 2 \end{array}$$

**h. Estimate**

$93 \div 5 \doteq 100 \div 5$

$\doteq 20$

**Exact Answer**

$$\begin{array}{r} 18\ \text{R3} \\ 5\overline{)93} \\ \underline{5}\downarrow \\ 43 \\ \underline{40} \\ 3 \end{array}$$

**i. Estimate**

$495 \div 6 \doteq 480 \div 6$

$\doteq 80$

**Exact Answer**

$$\begin{array}{r} 82\ \text{R3} \\ 6\overline{)495} \\ \underline{48\phantom{0}} \\ 15 \\ \underline{12} \\ 3 \end{array}$$

**j. Estimate**

$369 \div 4 \doteq 400 \div 4$

$\doteq 100$

**Exact Answer**

$$\begin{array}{r} 92\ \text{R1} \\ 4\overline{)369} \\ \underline{36\phantom{0}} \\ 9 \\ \underline{8} \\ 1 \end{array}$$

**k. Estimate**

$987 \div 5 \doteq 1000 \div 5$

$\doteq 200$

**Exact Answer**

$$\begin{array}{r} 197\ \text{R2} \\ 5\overline{)987} \\ \underline{5\phantom{00}} \\ 48 \\ \underline{45} \\ 37 \\ \underline{35} \\ 2 \end{array}$$

**l. Estimate**

$405 \div 7 \doteq 420 \div 7$

$\doteq 60$

**Exact Answer**

$$\begin{array}{r} 57\ \text{R6} \\ 7\overline{)405} \\ \underline{35\phantom{0}} \\ 55 \\ \underline{49} \\ 6 \end{array}$$

**5. Textbook, page 93, Skill Bank Looking Back, questions 4.b., 4.d., and 4.f.**

**4. b.** six thousand sixty
**d.** twenty thousand two hundred
**f.** five hundred seventy thousand two

**6. Textbook, page 93, Skill Bank Looking Back, question 4.a., 4.c., and 4.e.**

**4. a.** one thousand one
**c.** eighty-four thousand thirty
**e.** three hundred three thousand thirty

**7. Textbook, page 93, Skill Bank Looking Back, question 5**

**5. a.** 360, 663, 36 036, 63 030, 330 600
**b.** 10 010, 10 101, 10 111, 11 011, 100 100

**8. Textbook page 93, Skill Bank Looking Back, question 6**

**6. a.** 13 458
**b.** 85 431

**9. a.** 527, 725, 50 765, 52 576, 525 256
**b.** 1100, 1101, 10 001, 10 101, 11 010

**10. Textbook, page 89, Problem Bank, question 4, 5, or 6**

**4.** The number of stickers Beth bought is $16 \times 24 = 384$.
The number of pages they will fill is $384 \div 8 = 48$.

**5.** There are 263 children. A team has 9 players. $263 \div 9 = 29$ R2. You can make 29 teams, but there are 2 players left over. Put one extra player on each of 2 teams. So, there are 27 teams of 9 players each and 2 teams with 10 players each.

**6.** The total number of pages in the album is 60. The number of pages already used is 12. The number of pages remaining is $60 - 12 = 48$. Elise has 4 brothers. The number of pages for each brother is $48 \div 4 = 12$ pages.

**11. Textbook, page 90, Problem Bank, question 7.a.**

Since Tamika is 13, it will cost both Tamika and her father \$15.00 each for a deck chair in June and \$20.00 each in September. For Bret and Ben, it will cost half-price each. In June that is $\$15.00 \div 2 = \$7.50$, and in September that is $\$20.00 \div 2 = \$10.00$.

In June, it will cost $(2 \times \$15.00) + (2 \times \$7.50) = \$30.00 + \$15.00 = \$45.00$.

In September, it will cost $(2 \times \$20.00) + (2 \times \$10.00) = \$40.00 + \$20.00 = \$60.00$.

It will cost \$15.00 more in September.

**12. Textbook, page 91, Problem Bank, question 8 or 9**

**8.** Use guess and test.

$\boxed{100} \div 10 = 10$ and $10 + 18 = 28$ (The number 100 doesn't work.)

$\boxed{50} \div 10 = 5$ and $5 + 18 = 23$ (The number 50 doesn't work.)

$\boxed{20} \div 10 = 2$ and $2 + 18 = 20$ (The number 20 works!)

The number is 20.

**9.** Use guess and test.

$3 \times \boxed{1} = 3$ and $3 + 4 = 7$ (The number 1 doesn't work.)

$3 \times \boxed{2} = 6$ and $6 + 4 = 10$ (The number 2 works!)

The number is 2.

**13. Textbook, page 91, Problem Bank, question 10 or 11**

**10.** You can make an organized list of the possibilities.

- If you buy one popcorn for \$3.00, you would have $\$13.50 - \$3.00 = \$10.50$ left. Then, four colas would cost $4 \times \$2.50 = \$10.00$. You would have 50¢ left.

- If you buy two popcorn at a cost of $2 \times \$3.00 = \$6.00$, you would have $\$13.50 - \$6.00 = \$7.50$ left. Then, 3 cola would cost $3 \times \$2.50 = \$7.50$. You would have spent all the money.

- If you buy three popcorn for $3 \times \$3.00 = \$9.00$, you would have $\$13.50 - \$9.00 = \$4.50$ left. Then one cola would cost \$2.50. You would have $\$4.50 - \$2.50 = \$2.00$ left.

- You could not buy more than three popcorn because four popcorn cost $4 \times \$3.00 = \$12.00$.

The only possible answer is two popcorn and three colas.

**11.** He jogged farther each day than the day before, so he must have jogged 9 km on Thursday.

$$4 \text{ km} + 8 \text{ km} + 10 \text{ km} + 9 \text{ km} = 31 \text{ km} \text{ and } 36 \text{ km} - 31 \text{ km} = 5 \text{ km}$$

Lester must have jogged 5 km on Tuesday and 9 km on Thursday.

**14. Textbook, page 91, Problem Bank, question 12, 13, or 14**

**12.** If one of the numbers was 5 less, the number would be the same and their sum would be $35 - 5 = 30$. Then $30 \div 2 = 15$, so one number is 15 and the other is $15 + 5 = 20$.

**13.** Work backwards. The product of the numbers is $24 \div 2 = 12$. Since $3 \times 4 = 12$, and difference between 3 and 4 is 1, the numbers must be 3 and 4.

**14.** Use guess and test.

$\boxed{1} + \boxed{24} = 25$, but $\boxed{24} \div \boxed{1} = 24$ (not 1 less than 1 or 24).

$\boxed{2} + \boxed{23} = 25$, but $\boxed{2}$ does not divide $\boxed{23}$ evenly

$\boxed{3} + \boxed{22} = 25$, but $\boxed{3}$ does not divide $\boxed{22}$ evenly

$\boxed{4} + \boxed{21} = 25$, but $\boxed{4}$ does not divide $\boxed{21}$ evenly

$\boxed{5} + \boxed{20} = 25$, and $\boxed{20} \div \boxed{5} = 4$ (4 is less than 5)

The numbers are 5 and 20.

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# Cut-Out Learning Aids

## Place-Value Chart

| Hundred Thousands | Ten Thousands | Thousands | Hundreds | Tens | Ones |
|---|---|---|---|---|---|
| | | | | | |

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